The Iron A

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Hydraulic Riveting Machine.

We show in the accompanying illustration a fixed hydraulic riveting machine, recently erected at the Creusot Works, France, by Mr. Tweddell, of London, England.

The machine can take a row of rivets about 6 ft. 6 in. 1 ng, and the compressing strain is about 80 ons per rivet when the machine is doing its maximum, which can be reduced to 20 tons by taking weights off the accumulator. This is by far the most powerful riveting machine ever made. One at Jarrow, made for Messrs. Palmer, can take in a seam 11 ft. long ; but the strain per rivet is only 30 tons. The great range, however, of the Jarrow machine enables a marine boiler shell to be riveted straight off, without stopping to turn it end for

In the machine we illustrate, pressure is suplied by two-throw 1% in. pumps, which force water into the accumulator, which is of the differential type, and loaded to 1500 lbs. per square inch; when the accumulator is filled a rod is caught by a tappet, this stops the suction pipe to the pumps. The water is led from the accumulator to the machine, and by a suitable valve the ram is worked. Only one valve is required for the whole plant, everything is above board and get-at-able, although owing to the extreme neatness of the arrangement and the high pressure used, the head of riveting standard is very small and out of the way of everything. The speed of these machines can be regulated from 25 to 2 rivets per minute. They require little or no foundation; the exhaust water returns to a small cistern, as shown, and from that it again goes to the pumps. These machines are now in use at every large works, and in the dockyards of every European country.

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MP.

On the Use of Silicious Cast Iron in the Bessemer Process.

BY P. TUNNER.

We know very well that a cast iron rich in silicon is everywhere in demand for the Bessemer process. This demand is founded on the circumstance that the Bessemer charge gets much hotter with a strongly silicious cast iron than with one containing less silicon; because the greater portion of the silicon burns, especially in the first part of the process, and the temperature thereby produced in the bath of metal is higher just in proportion as a greater quantity of the silica thereby produced remains in the convertor, forming a slag. As a rule, the Bessemer works require a cast iron with at least 2 per cent. of silicon, which percentage is considerably exceeded in iron made with coke and highly heated blast; not unfrequently it reaches 3 or 4 per cent., and even more some times. In charcoal iron, where, too, the blast is generally not very highly heated, the amount of silicon, as a rule, does not reach 2 per cent. In this connection the relations of the Bessemer works in Sweden is a striking one, most of them being run on charcoal iron with basic charge, and a blast seldom exceeding 3000° C (5432° Fahr). The quantity of silicon in Swedpercent. Very recently, however, it seems that in Sweden, too, at some Bessemer works, which have blast furnaces connected with them where a hotter blast and less basic charges are employed, only such cast iron is employed as contains more silicon. lly they employ a east iron less rich in silicon and they purposely do not recarbonize at the end by throwing in spiegeleisen, but cut off the blast sooner. In order to obtain a corresponding heat in the charge of less sticious cast iron. charges of equal size are finished in a much shorter time at the Swedish plants than elsewhere, thus with charges of 60 to 80 cwts. of cast iron the blast is cut off in from 9 to 12 minutes, while in other places with more silicloss cast iron the time is about twice as long.

Experience has shown that a farther result this difference in the quantity of silicon in the cast iron is that Swedish Bessemer ingots are on an average not so dense and free from pores, but, on the other hand, of course, show much smaller percentage of silicon than that prepared in other places from more silicious

In regard to the greater number of pores in Swedish ingots, they can be harmless only when in the subsequent working of the ingot they entirely weld together. Since in east blocks, which are otherwise perfectly dense, these pores most frequently make their appearance chiefly in the center ; it is hoped that they may be entirely removed or welded out by the following device : The blocks while still quite hot nace and gradually reheated, whereby it is posthe upper end of the small ingots of crucible leave no doubt that Karsten has over-estimated

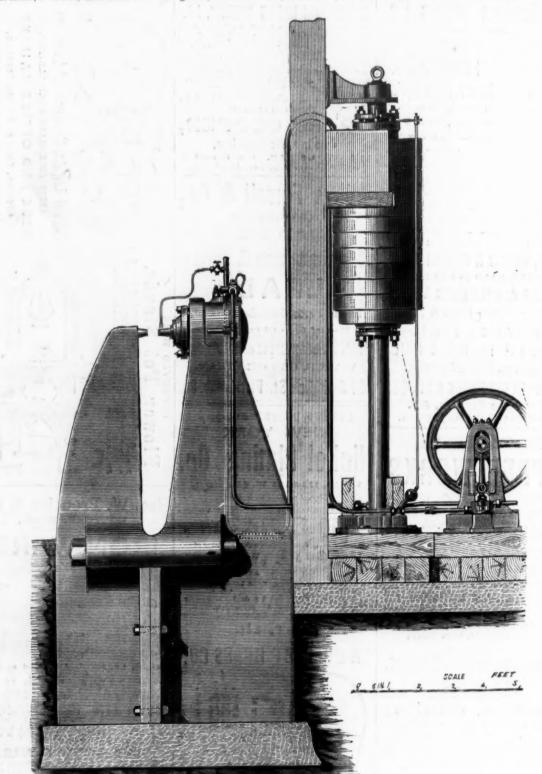
object may, of course, be gained. Beside, the avoiding of any intermediate chilling which would cause it to crack, can only be a benefit.

are the result of cracks caused by incautiously

heating or cooling.

for tires, but not for tools, have proven that it corresponding quantity of manganese present. berg (made from coke iron), by a test made at serve the greatest possible strength and tenac Certainly many of the flaws in Bessemer steel the general assay office in Vienna, 1 per cent. of ity, which is an essential condition for tool given to this part. In the use of ingots for simultaneous presence of manganese, showed the Bessamer process, yet the quantity remainrails, where it makes but little difference that there was 0.54 per cent. of silicon and 0.26 ing in the steel is always greater when there is whether the amount of silicon be 0.1 or 0.5 per per cent. of carbon in an iron free from man-more silica in the cast iron. cent., it seems, of course, more convenient and ganese, which was easily worked hot, and also From this relation we can also explain an-

cast steel, form tubes reaching to the surface the injurious effect of silicon. Numerous is no special demand for tenacity or strength and through which the air can pass, the desired analyses of Krupp's cast steel, which he uses This statement is still truer where there is a uniform heating of the block, as well as the contains 0.3 to 0.5 per cent. of silica, and in On the other hand, when in all cases where the a very good malleable Bessemer steel from Neu- steel must be hardened for use, and must presilicon was found. In Bessemer metal made steel, the silicon can only be injurious, and just from silicious east iron, and used for rails, and in proportion to the quantity present. From In regard to the small amount of silicon in even for tires, the amount of silicon not infre-this it is evident why no good Bessemer steel swedish ingots, in my humble opinion it dequently reaches, and even exceeds, 0.5 per cent. serves more attention than has heretofore been The research of Mrazek with regard to the although most of the silicon is separated by



HYDRAULIC RIVETING MACHINE AT CREUSOT WORKS, PRANCE.

silicious cast iron like the English iron; but tenacious. Iron containing considerable man- posed to designate the hardness of Bessement where it is required to produce an excellent material like that, for example, exhibited by Fagersts, of Sweden, at the Vienna Exposition of 1873, the influence of silicon on iron must first

be more carefully studied. It is quite striking how different, and frequently how diametrically opposite, are the views advanced by different authors in regard to the influence of silicon on the properties of iron. I will not here enter into a nearer deacription of Schaffhautel's theory, that carbon alone is not able to form steel, but that the simultaneous presence of silicon is indispensafrom easting are immediately placed in a fur- ble. Karsten, on the opposite side, considers silica so detrimental to the strength of iron, sible to obtain, bath in the center and near the that wrought iron, as well as steel, with more surface, a temperature adapted to the working than 0.05 per cent. of silicon, ought not to be of the block, and hence, when brought under called good, and a wrought iron with 0.37 per the han mer of roll its interior pores, as well as cent. of silicon should be, according to his exterior, would be filled up or welded out. In-assured as the inner pores do not, like those at ity, whether not or cold. Recent investigations

safer for the Bessemer workers to employ a that when cold, but not hardened, it was quite other fact. It will be remembered that I proganese, like that from Neuberg, may, according metal by the numbers 1 to 7, and this method to Mrazel, contain over 1 per cent. of silica of numeration has been quite generally intro without being especially hard to work when duced into Austria, Hungary, and Germany.

erted on the character of iron by silicon agree brittleness, could never be employed, but both tolerably in this, that silicon makes the iron of these numbers find representatives in the harder, but in a smaller degree than carbon. non-silicious iron with 11/4 to 13/4 per cent. of There is a similar relation between silicon and carbon, which are marketable products of the carbon in their effect on the fusibility of the Swedish plants, at least at Fagersta. iron, since silica also renders iron more easily cooled, is scarcely rendered any harder by the

to be used without hardening, and where there

All recent investigations of the influence ex- corresponding to Nos. 1 and 2, owing to their

fusible, but to a less degree than carbon. A recently found it to their advantage, like in striking difference, however, between these two other countries, to resort to a cast iron richer bodies in their influence on the iron is this, in silicon for the manufacture of rails and tires, that silicious iron, when heated and suddenly yet those manufacturers which desire to pro-From all this it follows that not too large a make a mistake by using east from with less percentage of silicon is uninjurious (and per-baps a benefit, on account of the increased hardness) in all those kinds of iron which are

temperature with basic charges, or the resmelting in a Siemen's furnace must be at a higher temperature, or a hotter blast must be used in the Bessemer process. The manufacture of peculiar kinds of steel, especially the hard, may be left to certain localities, like some in England, where it is made as crucible cast steel. For the softer kinds of steel, moreover, the Martin's process seems more in place than the ordinary Bessemer process, because the former, In consequence of the material employed, produces an iron freer from silica, and also less porous, than the latter.

Finally, it may be remarked that many kinds of crucible cast steel contain a not inconsiderable quantity of silicon. This is only in consequence of the addition of silicious iron, such as cast iron, the purest of which is always rich in silica as compared with steel; for the quantity of silicon which is reduced from the walls of the crucible and enters the steel can be scarcely a perceptible quantity, because if it were not so, no crucible steel would be free from silicon; but some, we know, is. Zeitschrift des berg, and huttenmannischen Vereines

Iron for Ship Building.

The Clyde Ship Builders' and Engineers' Association have addressed a memorial to the Board of Trade respecting the amendment proposed by Mr. E. J. Reed, and which proposes to establish a test for iron supplied for or used in ship building. The memorialists object to the clause for the following reasons:

1. It is uncalled for and unnecessary, and not calculated to promote the security of life and property at sea. The causes of shipping disasters are numerous and varied, but the experience of the memorialists does not suggest an instance where a vessel has been lost through the defective quality of the metal employed in her construction.

2. The classification societies have regulations which are amply sufficient to insure the quality of the material; and if vessels, as is usually the case, be surveyed regularly in the course of building, inferior iron would be readily detected. Ship owners can, of course, take means to see that only proper material is used. The proposed test would not insure the more general use of good iron, and it might (though the memorialists do not think it would to any serious extent) be evaded.

3. The proposed testing would add greatly to the cost of production of ships and machinery. (1.) By enhancing the manufacturers' prices for iron. Where a test is employed or the quality guaranteed, the price is very much increased. (2.) By causing continual delays in the progress of the work, by which men and machinery would necessarily be kept idle. It would certainly be inconvenient, if not absolutely unworkable, in daily practice. (3) By increasing the liability of the manufacturer of the iron, or the constructor of the ship, to have it returned in consequence of a defect, which has only a statutory existence.

4. If fron must be tested by strain or bending, it should be done at the rolling mill or the forges where made, to avoid the expense of carriage of rejected material, and reduce the delay and responsibility of the users to a mini-mum. The different brands should have a standard test, and when once passed by the inspector should ever be unchallengeable. The inspector should be a government officer, stationed at the works where the fron is made, as is the case in distilleries, &c.

The result of the ir with the high rate of wages prevailing here, would probably result in driving the important industries of ship building and engineering to a great extent to other countries, where they will be free from exceptional legal restrictions.

Glass as a Dress Fabric.-The Chicago Times says: The suggestion that ladies' dresses may be made of the newly discovered unbreak able and elastic glass, has thrown the fashion editors into a state of profound agitation. Infrangible glass dresses! What a grand in-novation! When the new invention shall have other fact. It will be remembered that I proposed to designate the hardness of Bessemer metal by the numbers 1 to 7, and this method of numeration has been quite generally introduced into Austria, Hungary, and Germany. At Bessemer plants here the hardest grades corresponding to Nos. 1 and 2, owing to their brittleness, could never be employed, but both of these numbers find representatives in the non-silicious iron with 1½ to 1½ per cent of carbon, which are marketable products of the Swedish plants, at least at Fagersta.

If several Swedish Bessemer operators have recently found it to their advantage, like in other countries, to resort to a cast iron richer in silicon for the manufacture of fails and tires, yet those manufactures which desire to produce a certain kind of steel which is to be hardened for use (like Seafensacht), would not make a mistake by using cast 'iron with less silicon, in it. In order to obtain a corresponding to the blast furnace must be run at a higher of the blast furnace must be run at a higher of the blast furnace must be run at a higher of the silicon of the impulsation.

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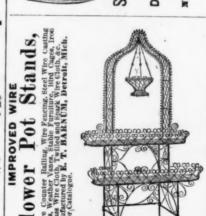


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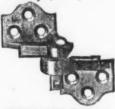
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Wire-Rod Rolling and Wire-Drawing. vel? How one or two are now able to do that

G. BARRY WALL, M. E.

tially modern invention. We find, however, in by the power of water, carries with it an enorthe works of many ancient authors passages mous cylinder, the outer part of which is armed mentioning the existence of metallic wire; and | with sharp teeth, which possess great strength; in some indicating, though hardly describing, and they selze and bear with them small mathe methods of its manufacture. The first re- chines geared to them; also they impart the liable information we have on the subject is motion of the water wheel to the cylinder, from the Scriptures. In a description of the about to stop by reason of the great resistance sacerdotal robes of Aaron, from the 39th chapter of Exodus, we find the following: 'And they did beat the gold into thin plates, and cut it into wires," etc. At this period-1490 B. C-the wire was prepared by cutting the metal into thin strips, and was used for

The Egyptians, in advance of every other nation in the knowledge of the arts, made wire of gold and silver at an extreme'y early date. In the Abbot collection of Egyptian antiquities, in the possession of the New York Histori cal Society, are many curious and interesting specimens of jewelry, formed, in part, of gold wire, twisted into various devices. No records exist from which any information as to the age of these specimens could be obtained One of the specimens-a necklace found at Denders bears the name, in hieroglyphics, of Menes, the first Pharaoh of Egypt, who reigned 2750 years B. C. Oval plates of gold, which bear these inscriptions, are connected by a rude chain of gold wire.

Of the method by which this wire was pre pared we have no account, but careful inspection reveals the fact that it was hammered. A bracelet made of twisted gold wire, the ends in a tomb at Sakkarah. The metal forming this bracelet is smooth and uniform, examination failing to show traces of hammering. At an early date arrangements will be made, and deroscopic examinations of these jewels may show the nature of their preparation.

The collection contains a large number of ery beautiful specimens, all in a good state of preservation; but, unfortunately, we have no eliable information as to their age and methods of manufacture. At a later period wire was made by repeated hammering, as appears from the mythology of the Greeks and Romans. In the Odyssy, Lib. viii., 273, we find, "He (Vulcan), brooding deeply, straightway departed to go to his forge. Having aced a large mass upon the anvil, he did forge and beat it with the hammer into fine pire, and formed it into a web of great strength and firmness, and which could not be broken.' A few lines further on we find: "It was pre pared so skillfully that no one could discern it, not even the gods themselves." At the time of the writing of the Odyssy, 800 B. C., the art of making wire was extremely tedious, as we may judge from the above.

In Ovid's Metamorphoses, written about the time of the accession of Julius Cæsar, we find the same fable treated of in almost the same words. Vulcan, being informed by the Sun of the armors of Mars and Venus, prepares the web above mentioned. "Both his senses and the work which his right hand was then doing quitted him on the instant. Immediately he files out some slender wires of brass, and nets and meshes, which can escape the eye. The finest threads cannot surpass that work, nor yet the cob-web that hangs from the top of the beam."

We are not to believe, from the above fables, that wire of such character did exist; but they prove conclusively that the ancients did, in reality, make for special purposes wire of remarkably small sizes. Many other classic authors mention wire in various connections. but from none of them can we gather that it was prepared by any other method than by forging with the hammer.

Gold wire was used quite extensively for the garments of royal personages. Pliny speaks of "anneo textili sine alia materiale," fabrica of gold without any other material.

Lampridius, in the Life of the Emperor Heliogabalus, A. D., 220, describes a tunic worn by the latter composed entirely of gold. The celebrated "cloth of Attalus" was formed in part by interweaving threads of gold. The Emperor Alexander Severus, A. D., 222-235, spoke of the folly of employing gold for textile fabrics; because by this they were rendered stiff and cumbersome. In the museum at Portici, which contains a variety of articles dis covered at Herculaneum, there are three metallic heads, having hair formed of wires. A Venus from the same collection has on the arms and legs, golden bracelets formed of wire twisted round them. In specimens of Etruscan jewelry we find the most beautiful and delicate designs produced by the skillful arranging of fine gold wire. Later, toward the end of the third century, silver was treated in a like manner, and woven into cloth.

The art of drawing wire through holes in dieplates was probably discovered by the Hindoos or Egyptians long before its introduction into Europe. The Venetians and Italians are said to been applied to rolling fron roas, but it is have known of this method of drawing wire at some time between the sixth and tenth centuries. The invention of drawing iron wire is classed by Beckman as among those of the fourteenth century. Wire was made by drawing through die-plates in Augsberg and Nunemberg as early as 1850. About this time, or at some period later, a most important improvement was made in the art of wire making. It was the invention of a large drawing machine, driven by water-power. It is described by the poet Eobanus Heasus, 1540, very ingeniously, in very peculiar Latin (omitted).

"Any one beholding the great number of wheels by which the machine is operated, and with what great force it draws out the ironthat it may be perfect in its design—will wonder greatly. Can any one see this and not marhave known of this method of drawing wire at

which a thousand men were not able to do by any art previously known.

"One condemns the sloth of all past ages which knew not such wonderful inventions as The art of wire-drawing proper is an essen- exist in our generation. A great wheel, driven imposed upon it. When this machine is set in motion, by so great a force as the water below it, one man, by the movement of a lever, is able to control the motion of the whole. Through a plate the black iron is pulled, and is drawn down to a fine wire, by the various parts of the machine; and it is compelled to assume this or that size as desired. A head of iron similar to that of a dragon, grasps the divided iron by means of its teeth; this it holds, and moving quickly-in obedience to the motion of the lever-draws the metal with it. Falling again the rods of iron are seized by the teeth, and, by the rapid movement, are drawn out into fine wires, which are received from the mouth of the dragon, and wound in many coils about reels near at hand."

The above described machine was probably constructed at Nunemburg, by a certain Rudolf, who kept it for many years a secret, and thereby amassed a considerable fortune. From this time forward considerable progress was made in the art of wire drawing, almost every nation of Europe having contributed toward its ad-

In 1650, Jacob Momma and Daniel Demetrius, two Germans from Augsberg, constructed a of which terminate in a lotus flower, was found | wire mill near Richmond, England, making use of the water mill previously described. Edward IV., in 1465, had forbidden the importation of wire from any foreign country into England. From this it may be inferred that the manufacture was of considerable importance at that time. Previous to the introduction of the German mill, the process of making wire in England was laborious in the extreme.

The iron after baving been beated was gradually brought down by hammering-some kind of tilt hammer being employed-to a manageable size; then by hand hammering; and was finally reduced by drawing through die plates by main strength. Monmouthshire and the Forest of Dean had, at this early period, become quite celebrated for their wire work : several authors of the time-Pettres, Yarranton and others, call special attention to the vast quantities of raw fron which are there made into bar iron and wire.

Mr. John Webster, and his nephew, Mr. Webster, of Shrewsbury, built quite extensive mills near the city of Birmingham in 1730. Several other wire mills were located at Birmingham soon after, and the greater part of the wire made in England was brought from the above named place.

For many years the manufacture of wire was quite expensive, and the produc-tion very slow. It was necessary to hammer the iron bars until they had reached a size which would allow their being drawn through die-plates, the larger sizes of wire being drawn down by means of horse-power, and the smaller size by hand labor.

With the introduction of the rolling mill came revolution in wire manufacture. The old mills were pulled down and more spacious ones substituted. Under the old system it required the hammer to be kept busy continually in order to prepare material to draw 20 cwt. of average sizes of wire in twelve hours, while one pair of rolls will be able to produce in the same pair of rolls will be able to produce in the same time sufficient material for as many tons. It is now possible to produce within a tew minutes, from a rough bloom, by the simple operation of rolling, finished wire rods of an eighth of oue inch in diameter, and if necessary rolls may be constructed that can turn out rods of even less size and with great accurrent.

size, and with great accuracy.
STEVENS INSTITUTE OF TECHNOLOGY, Hoboken, N. J.

Four-High kolling Mills.

The London Iron Trade Journal, describes Mr. James J. Beckly's patent wire mill as fol-

The mill is "four-high." The bottom pair of rolls revolve at a higher rate of speed than the top pair. The "billet" is transferred from the top pair to the bottom pair by mechanical means entirely on one side of the train, thus enabling the mill to be worked with half the number of hands usually employed, beside getting rid of the iron in half the time. mill is therefore capable of rolling twice the mill is therefore capable of rolling twice the quantity of iron possible in a mill of ordinary construction with half the number of men. The most arduous part of the work, the "bolting down," is also reduced by one-half, and the work itself is rendered easier to the single man who is employed, on account of the lower speed at which the top rolls revolve as compared with the ordinary mill. This patent mill, therefore, attains the two great objects to the accomplishment of which all modern improvements in rolling mills are directed, viz.: economy in the amount of labor necessary to work them, and ease and comfort to the viz.: economy in the amount of labor necessary to work them, and ease and comfort to the men employed. At present the patent has only been applied to rolling from rods, but it is equally suited to small sections of hoops and merchant from.

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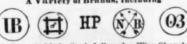
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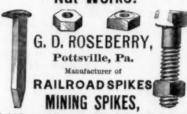
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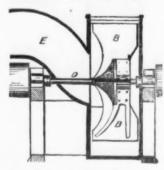
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New Patents.

We take the following abstract of new patents, issued May 25, from the official record just received :

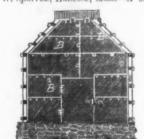


To Jas. White, Cleveland, Ohio .- The hub of the fan wheel is cone shaped, with the apex toward the induction pipe. The edges of the fans upon the same side of the machine are curved; also, to facilitate the passage of shavings, to discharge which is the purpose of the machine

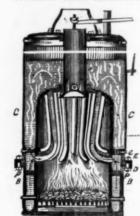
In a suction fan, the com bination of the cone C, curved 4 edge wings B B, with the revolving shaft D and fan case A. BELL PULL To Clemens Clay, Philadelphia Pu .- 1. A bell pull face plate A having ways or lugs a' a' on each side of the opening a for holding the loop E.

2. In combination with the plate A, having the ways a' a the removable adjustible loop E.

CHARCOAL KILN. To W. Sparrow, Hancock, Mass.-A sectional



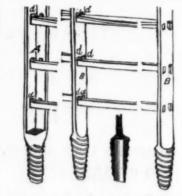
charcoal kiln for the dry distillation of wood composed entirely of thin metal sheets, which are formed into sections B B, and adapted to be placed on, and combined with a perforated foundation.C, of stone.



To George H. Starbuck, Troy, N. Y .- A steam poller composed of a cast iron inner shell, A, and water leg B, with strengthening braces P and flange D, all cast in one piece, and an upper shell, C, of boiler iron, provided with a flange, E, secured to the fluange D of the water leg by means of screw bolts and nuts e.

IRON FENCE.

To M. G. Freeman, Blcomington, Ill .- The independently removable ralls D, having notches



z at their ends, and secured by wedges d alter nately in the posts B, having a double series of openings for receiving the same.

PLANE IRON.

To John J. Ralya, Cleveland, Ohio. - Wood can be smoothly dressed, regardless of the irregularity of its grain, by means of a plane iron pro-



vided upon its front side with a longitudinally adjustable cap, which at its forward end has an angle of 90° with relation to the outer face of the iron.

Machinery without Oil-Metalline.

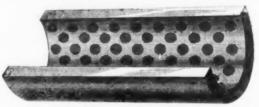
is more liable to excite skepticism than one which involves a radical change in previous practice or preconceived and well settled theories. Unbelief in such cases is certainly reasonable, and credence, indeed, should not be accorded in the absence of the most positive affirmative evidence in favor of the invention. instances in which the claims of the originator are substantiated, and no error or unfair conaltogether put aside.

ealized the claims advanced.

would obviously render a scientific investiga-

prising that the friction should fall below the limits indicated." From this may be gleaned a To the Editor of the Iron Age .- No invention reason why metalline should necessarily greatly reduce frictional loss, the facts continuing as already exemplified in practice. At this point, however, we dismiss further theoretical consideration to turn to the method of making and applying the material to machinery.

In general terms, metalline is an alloy, containing, however, many substances not me When, however, experiments extending over a tallic in nature. Plumbago, as currently supsufficient length of time show a succession of posed, is not a necessary ingredient, as it is entirely absent in certain varieties of the compound, and present in a very minute propordition can be found to exist in such trials, then tion in others. The manufacture consists in no candid mind should refuse faith to an ex- grinding the various ingredients to an impalpatent coequal with the proof of practical de- ble powder, mixing them according to certain monstration, and this even if deduction of definite formulæ, which are the direct result of future probabilities based upon the latter be experiment, and subjecting the mass to immense hydraulic pressure in chilled steel molds. Gauged by this reasoning, metalline must be From these last the metalline emerges in the conounced successful, since in a large and form of a short rod or plug from one-eighth to aried category of cases its operation has fully five-sixteenth inch in diameter, in condition either soft enough to be readily dented by the The large number of ingredients entering nail, or sufficiently hard to require a knife to nto the composition of this material, as well as cut it; also in all intermediate stages. It looks the various ways of putting them together, like black lead, but is more unctuous, and somewhat lighter in color. To insert it, the tion into the natures and properties of each, an box or gib, for example, is bored with shallow dmost endless task. Slight modifications in holes, these being made with a square ended the manner of combining the ingredients, as bit, in order to leave a flat bottom. Their depth well as in the proportioning of the same, re- is about three-sixteenths of an inch. Into sult in changes of considerable magnitude in its working, and therefore the determination the plugs being sufficient to insure a tight fit, of the coefficient of friction for one variety of and the surface is smoothly reamed off. The metalline would yield data entirely out of the annexed illustration will render the above easily way when referred to another variety. An an-alysis of metalline made for very heavy bear-method in which the holes are placed, in order ngs would tell nothing of the composition of that when the shaft begins its revolutions the metalline prepared for light journals, or an ex- metalline will be carried directly over every



amination of metalline to withstand great heat | portion of the metal surface left within the would afford no knowledge of metalline for use m an ice machine. Nor would any analysis give any idea of the physical manipulations which play so important a part in its manufacture. Hence, to reach a proper consideration of the substances, we are led first to investigate its practical operation, and second to account for the results due thereto by reference to the laws of friction governing cases most nearly parallel

If a smooth plate of metal be rubbed over with a fragment of metalline, and then wiped with a cloth, no perceptible change results. The surface, polished before, appears unaltered, and a clean haudkerchief passed over it is unblackened. If, however, a plate of metal similarly prepared be superposed, the two faces, which by quick rubbing together before the application of metalline rapidly heated and bound, now slide smoothly one upon the other. Under the microscope any surface, no matter how highly polished, appears rough. A succession of minute prominences and depressions are shown, which, it may readily be conceived, if brought in contact with a similar surface, will interlock with the inequalities of the latter, and heating and cutting due to friction will inevitably follow.

Subjected to the same scrutiny, a piece of polished metal metallined presents a different appearance. The surface, smooth before, remains so, or nearly so, till, and a film is easily recognized which fills up the minute, infinitessimal pits, and brings the surface to a unifrom

There is, therefore, a purely sliding motion between surfaces in immediate contact, and hence the action of metalline is in no wise akin to that of oil which lessens friction through holding the surfaces constantly apart by its own molecules which may be considered themselves constantly to rotate.

In pursuing our line of inquiry, the question which almost instantly suggests itself from the above is whether the material once distributed mitted the term, stays there, for obviously if it is to require constant renewal difficulties of great moment at once occur. In answer we are referred to the aspect of bearings which have been running constantly over a period of nearly five years. While micrometer measurements might possibly detect signs of wear, ordinary instruments fail to indicate the same.

The writer has critically examined journal boxes which he had learned from disinterested users had been under employment for the length of time above mentioned, without perceiving any difference in their interior surface from those which similarly fitted had not been in operation a week, and has beside had brought to his notice instances in which constant renewal of the metal was necessitated with the best oil, while with metalline the same material has lasted already a period six or seven times longer than ordinary, and still gives no sign of deterioration. At the end of this article are mentioned several practical utilizations of metalline. The machinery is in use by well-known firms, and is open to inspection, so that any doubted assertion need not be accepted on faith, but may be subjected to the test of ocular proof, thus enabling the examirer to base his judgment upon the same data employed by the writer.

With sliding surfaces constantly lubricated, and with a hard material, according to General Morin's now standard experiments, the friction came more and more perfect, and it is not sur- pany.

box. The result, as we have already stated, is the formation of a film, which seemingly, while obviating the effects of friction, prevents wear.

The advantages which an invention of this description offers, when its utilization is extended to all classes of machinery, are too obvious to need much dwelling upon. There is the saving of oil, of time and labor in oiling, prevention of injury from bad oil, of injury to manufactured goods or goods in course of manufacture, reduced insurance, freedom from danger of spontaneous combustion of oiled cotton waste, saving of material in journals, as metallined boxes can be cut down in size from three diameters to one diameter of the shaft, and finally a gain in comfort, convenience and cleanliness hardly to be overestimated.

One of the most recent and remarkable cases in which metalline has been applied involves the extraordinary speed of 19,800 revolutions per minute, this being the velocity of a spindle nine-sixteenths inch in diameter in a routing machine used in the printing establishment of Mr. Samuel Crump, of 77 Fulton street, in this

This has now been running for nearly three months, and has been, and now is, perfectly cold. In the same machine another spindle, similarly fitted, revolving at 16,800 revolutions, has been at work for ten months without heating, cutting, or wearing. No trial has offered a more crucial test to the material than this, unless it be that devised by Mr. F. Collingwood while acting as judge during the late American Institute Fair. Mr. Collingwood's test consisted in applying metalline to the pin of a block which sustained the weights of the heavy stones used in building the Brooklyn pier of the East River bridge. With oil the pin formerly heated, and invariably wore out with-in three weeks. Metalline was applied last fall, and the same pin is still in use, after seven month's continuous usage, showing no heating nor wear. A locomotive on the Harlem Railroad has had various of its parts fitted for over six months, which have been, and are now, constantly running without oil, and this while exposed to all kinds of weather.

Did space permit, we might fill a column with a record of instances where metalline has been substituted in place of oil. In and about this city machinery may be found fitted with this material-at the Delamater Iron Works, Booth & Edgar Sugar Refinery, the establishments of Messrs. A. T. Stewart & Co., the Stevens Institute of Technology, Messrs. Higgins & Co.'s carpet manufactory, beside in several other establishments, the addresses of which and of users residing outside of New York may be easily obtained by communicating with the company, whose advertisement will be found in another column. The recent enlargement by the American Metalline Company of the facilities for production indicates an increasing demand for the material, and, if we may judge from the busy condition of affairs at the factory, orders are plenty even in this present dull season

There is little doubt but that metalline is an invention of very much more than ordinary importance, and certainly, from its record, it deserves to be widely known to engineers and machine users generally.

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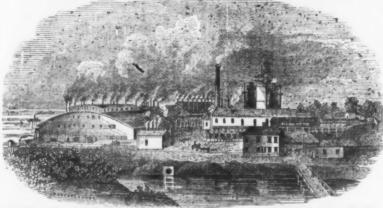
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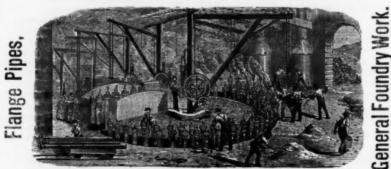
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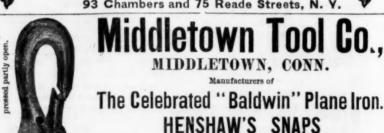
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Linseed oil improves greatly in quality by age, and ought to be kept at least six month after it has been expressed before being used. A strong drying quality can be given to the oil by boiling it either with or without the addition of other substances. The substances thus added are very various, the principal being litharge, acetate or sugar of lead, red lead and oxide of manganese, the last named when the body of the paint is to be zinc white. The most simple method of preparing drying oil is by boiling it for a considerable time without any addition, and drying oil can be prepared for common work by mixing 11/6 lbs. of red lead with one gallon of linseed oil, boiling them together, and afterward letting the oil stand for a few days for the lead to sink to the bottom. A onsiderable drying quality may be given to linseed oil and the color much improved, without its being boiled, by mixing about 1 lb. of white lead to the gallon of oil, and letting it stand a week or two until the lead and feculent parts of the oil have sunk to the bottom of the vessel in which the oil is placed. This is likewise a cheap way of purifying oil, as the lead can always be used for common purposes. Other things being equal, the most essential quality to be required in oils is their drying well, which, although it may be assisted by additions. is yet to be desired in the oil itself, as the effect of some pigments is sometimes such as to counteract the strongest driers and occasion great trouble and delay from the work remaining wet a considerable length of time. Nut. oil is more uncertain in its qualities than either linseed or poppy oil, and is frequently a long time drying. When of good quality it is very limpid, of an agreeable taste, sweet smelling, and free from rancidity or sediment. oil is extracted by pressure from the seeds of the plant, and should be white or very slight yelow in color, sweet, and without smell. Both nut and poppy oils are far inferior in strength, tenacity, and drying qualities to linseed, but have the reputation of keeping color better, and are on this account some-times employed in interior work, for thinning paints used for ornamental purposes, and which require to be very white or carefully executed. Driers for hastening the drying of colors are much used, in addition to the drying oils. Those most approved are sugar of lead and litharge. These when ground, and mixed in small quantities with paints, very much assist them in drying; indeed, some colors will not dry without them. Red lead is also an excellent drier, and in cases where its color is not objectionable is much employed. Sugar of lead is, however, the best drier, though somewhat more expensive than the others. In the last or finishing coats of light olors driers are generally avoided, as they have a slight tendency to injure the color. The spirits of turpentine for thinning the colors should be of good quality, which may be ascertained by weighing equal quantities and comparing the weights, the lightest being the may likewise be ascertained by noticing the degree of inflammability it possesses; the most inflammable is to be preferred. Those who are those of 20 in. diameter and upward will have much in the habit of using turps, as they are familiarly called, will tell by the smell their fluid to attain this temperature. The coating good or bad qualities, for good turpentine has a pungent smell, the bad a very disagrecable one, and not so powerful. Painting when properly executed will not present a shining, smooth and glossy appearance, as if it formed a film or skin, but will show a fine and regular grain, as if the surface were natural, or had received a mere stain without destroying the texture. For woodwork, before the paint is applied, the surface must be free from moisture of any kind and seasoned. Dampness, moisture, or unseasoned substances in woods, stopped in or covered over with paint, will in all probability tend to their destruction. The surface is then freed from anything which may in the outer scale is fusible only at a high temprevent the paint from becoming identified perature, is strongly magnetic, and slightly with the material. Thus in painting pine metallic in luster; while the inner layers are woods of any kind, the resin contained in the more porous, dull, and non-metallic in luster, knots which appear on the surface must be neutralized, or a blemish will show over every It will be seen that the iron has a tendency to knot; this is done by killing the knots with two rust from the moment it leaves the hammer or or more coats of red lead ground with water rolls, and that the scale above described must and mixed with size; a preparation known as composed of shellac, naphtha and some other hot at the mill; and although this answers for drying agent. The heads of nails having a while, it is a very troublesome method which filled up with putty or wood. The submitted leave many parts of the iron bare.

in about 48 hours. The paint requires renewing The metal is afterward rinsed in cold water, after every two or three years, when but two and, if necessary, scoured with sand, put again coats are usually required. For fine work such into the acid bath or pickle, and then well coat is rubbed with pumice or sandpaper and well dusted before the next is added.

In repainting old work, all dirt is carefully emoved with the stopping knife and duster, those places that are rough are rubbed with with turpentine. New patches and decayed parts are then brought forward with a coat of priming, all defects stopped and made good with putty, and the first coat or second color proceeded with in turpentine. The quality of the next coat will entirely depend upon the manner in which it is to be flufshed. If it is to be painted twice in oil and flatted, the next coat or third color should be mixed up chiefly n oil, and tinted like the finishing color, to form ground for the flatting. The greater the shine of the ground, the more dead will the finishing coat or flatting be; likewise the more dead the ground, the better will the finishing coatshine therefore it is a general rule that for finishin in oil the undercoat should be turpentine, and for finishing flat the undercoat, or ground color, should be oil, but it is to be observed that all turpentine undercoats have a little oil with them, and all oil undercoats, except the priming or first coat on new work, have a little turpentine with them. When ironwork has to be painted the engineer has a very different task to perform. Cast and wrought iron behave very differently under atmospheric influences, and therefore require somewhat different treatment. The decay of iron becomes very marked in certain situations, and weakens the metal in direc proportion to the depth to which it has penetrated; and although where the metal is in quantity this is not very appreciable, it really becomes so when the metal is under three quarters of an inch in thickness. The natural surface of cast fron is very much harder than the interior, occasioned no doubt by its becom ing chilled, or by its containing a large quantity of silica, and affords an excellent protection, but should this surface be at all broken, rust immediately attacks the metal, and soon destroys it. It is very desirable that the casting be protected as soon after it leaves the mold as ossible, and a priming coat of oil or paint hould be applied for this purpose, the other oats thought requisite can be given at leisure.

The following is the process to which all ast iron water pipes should be submitted. It was introduced by Dr. Smith, and is equally applicable to any other kind of casting that can be maintained : Each casting is thoroughly dressed, and made clean and free from earth or sand which clings to the iron in the molds, hard brushes being used in finishing the process to remove the loose dust. Every casting must be likewise free from rust when the paint is applied. If the casting cannot be dipped presently after being cleansed, the surface must be oiled with huseed oil to preserve it until it is ready to be dipped; no casting is on any account to be dipped after rust has set in. The coal tar pitch used as a paint in this process is made from coal tar distilled until the naphtha is entirely removed and the material deodorized. In England it is distilled until the pitch is about the consistence of wax. The mixture of 5 or 6 per cent. of linseed oil is recommended by Dr. Smith. Pitch which be comes hard and brittle when cold will not answer for this use. Pitch of the proper quality having been obtained, it must be carefully heated in a suitable vessel in a temperature of 300 deg. Fah., and must be maintained at not ess than this temperature during the time of dipping. The material will thicken and deteriorate after a number of pieces have been dipped; fresh pitch must, therefore, be frequently added, and occasionally the vessel must be en tirely emtied of its old contents and refilled with fresh pitch. The refuse will be hard and brittle like common pitch, and consequently worthless for the purpose. Every casting must attain a temperature of 300 deg. Fah., before be-The goodness of spirits of turpentine in gremoved from the vessel of hot pitch. It may then be slowly removed, and laid upon skids to drip. In the case of water pipes, all us, and not brittle, nor have the slightest tendency to scale off.

it must be noticed that when iron is oxidized by heating in contact with the atmosphere two or three distinct layers of scale form on the surface, and, unlike the skin upon cast iron. can be readily detached, as by bending or hammering the metal. The outer layer of this scale is more highly oxidized than the inner, and is slightly redder in tinge from the presence of a variable excess of ferric oxide over that contained in the inner layer. The oxide occurring metallic in luster; while the inner layers are less wittle and also less powerfully magnetic. come away. One of the plans to preserve the previous coats become dry, which is generally taining from 1 to 2 per cent, of sulphuric acid. Company.

In considering the painting of wrought iron

rinsed. If it is desired to keep iron, already cleansed, for a short time before painting, it is necessary to preserve it in a liquor rendered alkaline by caustic lime, potash, soda, or their carbonates. Treatment with caustic lime water is, however, the cheapest and most easy method, and iron which has remained in it for some hours will not rust by a slight exposure to a damp atmosphere. Although desirable, this nethod of cleansing the surface is impracticable in the majority of cases, and recourse must be had to scrapers and hard brushes to remove the scale of rust. Having obtained a clean surface, the question arises what paint should be used upon iron? Bituminous paints, as well as those containing variable quantities of lead, were formerly considered as solely available, but their failure was made painfully apparent when the structures to which they vere applied happened to be of magnitude, subcted to great inclemency of weather or to constant vibration. Recourse has, therefore, been nad to iron oxide itself, and with very satisfactory results. Iron oxide paints are made of two qualities. The first quality is the best adapted for iron work, and is made by purifying the oxides and placing them in retorts, when the various colors are mixed with them. They are altogether submitted to seven distinct processes in the course of manufacture. To insure large surfacing quanties, or the power of covering a large area with a small quantity of paint, the ngredients should be reduced to an impalpable owder before they are mixed with the oil, and, after mixture in first quality paint, they are ground for 7 or 8 hours. The second quality have their colors chemically combined by mixture, and are not so carefully prepared, although they are excellent for common work. A pound of iron oxide paint, when mixed ready for use in the proportions of two-thirds oxide to one-third linseed oil, with careful work, should cover 21 square yards of sheet iron, which is more than is bhtained with lead compounds. Oxide of iron paint endures a very great heat without material alteration, and keeps both its color and preservative qualities well. The author is of opinion that, when used under proper supervision. no better protection can be found for iron structures than oxide of iron paints. There is this difference to be noticed between the painting of iron and wood, that with the former. when a painter comes to spots of rust that cannot be removed, he should endeavor to incorporate them with the paint rather than paint over them. The repainting of iron involves carefully washing down and removing all dust, dirt and so on from the entire surface, every particle of rust being scraped and chipped off, the work receiving from 2 to 4 coats in oil, properly applied. The author would observe, in conclusion, that the real value of any paint depends upon the quality of the linseed oil, the quality and character of the pigment, and the care bestowed on the grinding and mixing, and as all this is entirely a matter of expense, cheap paints are not to be relied upon. He is convinced that the superiority of most esteemed paints is due to the above causes rather than to any unknown process or material employed in the manufacture, and their comparatively high price corroborates this opinion.

Flying Soundings .- William Thompson, in a letter to the London Times, describes an apparatus for taking flying soundings, which, he says, if used on board the Schiller after he speed had been reduced, would have enabled her "to feel her way around the Scilly Islands without ever coming nearer than the fifty fathom line, which, at its nearest, is four miles from the Retarriere ledges." He describes the apparatus as follows: "The apparatus consists in an oval weight of thirty pounds (lead or iron. but lead slightly to be preferred), attached by half a fathom of hemp cord to a ring or 'thim ble,' properly secured on one end of a length of 200 fathoms of pianoforte wire coiled on an exceedingly light wheel of thin galvanized sheetiron of about a foot diameter, mounted on a framework fixed in a convenient position on the ship's taffrail. The wheel has a second rim, with a simple kind of friction brake, by which constant force of five pounds is an when the wire is running out. There is also attached to the same shaft a ratchet wheel and pawl, which can be thrown out of gear or into gear at pleasure. A counter to count up two hundred turns completes the apparatus. To take a sounding by it let the weight hang by a short cord direct from the wheel and clear of the taffraii, lift the pawl and throw it out of gear, holding the rim of the wheel by hand till ready to begin, then let go the rim and stand by. The moment the wheel is heard to go slower lay hold of the rim with both hands (protected by a piece of canvas or thick leather gloves) and stop it; read the counter, and the sounding is complete. So far one man only has had anything to do. Two menworking on handles applied for the purpose, haul in the wire, and recover the lead easily and speedily."

American Telegraphy .- It appears that in the course of last year the Atlantic and Papatent knotting is also very much used-it is iron has been to coat it with paint when still cific Telegraph Company constructed new lines to the extent of 7281/4 miles. The company's system of lines and connections covers 14.612 been carefully punched in, all nail holes, from masters cannot be persuaded to adopt, and miles of poles, and 28,477 miles of wire, and it cracks, or other defects are stopped and the subsequent cutting processes to which it is affords direct communication with 1885 offices. The company's lines extend from New York surface of the wood is then rubbed smooth with Beside, a good deal of the scale remains, and city via Albany, Saratoga, Oswego, Syracuse sandpaper or pumice stone. The number of until this has fallen off, or has been removed, and Buffalo, thence by two routes to Ogden, coats usually given to new woodwork is four. any painting over it will be of little vaine. The Utah, where they connect with the lines of the The first, or priming coat, need have very little only effectual way of preparing wrought that the final coloring matter in it. After iron is to effect a thorough and chemical cleans and Buffalo a connection is effected with the priming, all nail holes or other superficial deling of the surface of the metal upon which lines of the Dominion Telegraph Company, of fects are carefully stopped up before the next the paint is to be applied, that is, it must be Canada; and at Rye Beach, N. H., with the uncoat is applied. The coats are laid on as the immersed for three or four hours in water condertaking of the Direct United States Cable SEND FOR ILLUSTRATED

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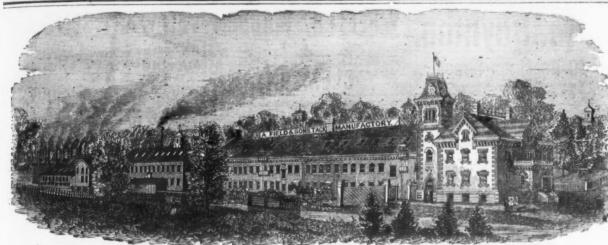
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BUSINESS ITEMS.

PENNSYLVANIA.

The Eric City Iron Works, Eric, are employng 125 people upon boiler, engine and saw mill machinery work, mainly for the extreme Southern country. They are operating a steam riveter in the manufacture of their boilers, which will make considerable noise in the mechanical world. One of them is being put up n the new boiler shop of the Globe Iron Works. Cleveland, which will soon be put to practical

The Barney & Smith Manufacturing Com oany, Pittsburgh, will furnish Miller platforms nd Westinghouse air brakes, and Porter, Bell Co., of the same city will furnish the loco otives, for the Hot Springs Railroad, Ark.

A government contract for bronze casting the Bureau of Engraving and Printing in the United States Treasury Department is being

filled by Attwood & McCaffrey, Pittsburgh. It is said that Lewis, Bailey, Dalzell & Co. Spang, Chalfant & Co., and Graff, Bennett & Co., have bought the Butler county gas well, and mean to conduct the gas through pipes a distance of some 20 mlles to their mills, to be ased as fuel in the manufacture of iron.

Tibbals, Shirk & Whitehead, Eric, are now mploying some 90 people, and making easts of 8 tons of stoves per day, on general patterns of cooking and heating, parlor, office and hall

The machine shops and foundry of J. B Crowell & Co., Greencastle, burned June 26. loss, \$60,000; lightly insured.

Hiram Woods, now employed at the Ætna Rolling Mill, New Castle, has adapted an attachment to a rolling mill which greatly relieves the workmen of strain and labor. He intro duces a third or auxiliary roll to assist in the return of the muck pile on two-high rolls. He also uses an incline table supplied with rolls, to ssist in the feed. The points made are similar to those in use at Johnstown and Bethlehem teel mills, but acquired by a different applicaion, and the device will save labor and expense wherever adopted.

NEW HAMPSHIRE

Messrs. D. Arthur Brown & Co., proprietor of the Concord Axle Works, at Fisherville, have largely increased the capacity of their works by the addition of a shop 74x24 feet, two tories, and additional machinery of latest improvements, including some special tools imported from England. The works are now running to their greatest capacity, and producing more goods than they have ever done before. These goods find a market in nearly every State in the Union, and are acknowledged as emg very superior in quality.

Blood's Locomotive Works, at Manchester, will be run for the present only five days in a week. About 150 workmen are employed there ow, which is less than one-fourth required to un the works at the full capacity.

The agricultural works which were recently partially destroyed by fire, at Lebanon, are in full operation again.

The Hardy Machine Company, Biddeford, have forwarded eight of their machines to the new Lockwood Mills, at Waterville.

MASSACHUSETTS.

A pulley has recently been cast at the foundry connected with the Putnam Machine Company's shop, Fitchburg, and is now being inished up, the diameter of which is 18 feet, with a face 43 inches wide, and weighs over 12 tons. It is a part of a double, 250 horse-power engine, which this company is building for a flouring mill in Akron, Ohio. The engine has 20 inch cylinders, 42 inch stroke, and the machine complete will weigh 30 tons

The entire manufacturing establishment of R. Ball & Co., Worcester, has been purchased by Witherby, Rugg & Richardson, who will continue the manufacture of wood working machinery, making a specialty of Woodworth, Daniels, and dimension planers, surfacing machines, tenoning, mortising, and resaw machines, saw benches, etc. The purchase includes the patterns, patents, good will corby R. Ball & Co. thus uniting the two establishments, the new quarters of Witherby, Rugg & Richardson being 26 Salisbury street.

The American Tool Company is running its founday at Hyde Park about two-thirds of the time and with half the usual number of

The tack factory at Assonet will resume opeations this month, with an increased number of machines.

In the screw mill at Holyoke a new " header has been placed, having a capacity of 120 the swiftest one previously used, and increasing The new "header" runs on the smaller also lately been started, and more are to be added.

The Ames Company, of Chicopee, has re ently made arrangements for the manufacture of the projectile invented by T. Clifford Arrick, the president of the company, which has heretofore been made at Baltimore.

CONNECTICUT.

It is not certain that the Sharp's Rifle Company will remove from Hartford to Bridgeport, as only \$20,000 of the \$40,000 necessary can be raised. P. T. Barnum gives \$10,000, D. W. Sherwood \$5000, and other parties liberal amounts, in the hope that Bridgeport may raise the necessary sum to secure the removal.

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& Co. They have added largely to the capacity of their establishment, and now employ from 20 to 30 men. They manufacture ice tools of every description, as well as their great specialty of files.

The Graffton Iron Company continue to make from 350 to 500 tons of iron per week. running on L. S. Gleveland, Champion and L. S. mine specular and Rolling Mill mine hematite. The works were kept in blast during the panie, not been compelled to stop an hour for anything but repairs since they were first blown

Ground for the erection of a stove manufacory has been purchased at Lorain, by Troy Building operations have been capitalists. commenced, and the establishment of the business, as a permanent enterprise at that place, is

The Akron Beacon says that since the beginning of operations of the Buckeye Mower and Reaper Works in Akron, about 60,000 machines have been manufactured in that establishment, During the manufacturing season just ending, about 7000 machines have been turned out, and the end is not yet. Many of the machines above referred to are mowers and reapers com-

The Novelty Iron Works at Cleveland have a large amount of miscellaneous manufacturing on hand, pertaining to bridges, roofs, jail cells, fences, rods and bolts for bridges, &c.

The members of the South Staffordshire Mill and Forge Managers' Association are now diecting their attention to a question of much mportance in the manufacture of finished iron the conditions under which coal as a fuel can be best used in the puddling furnace without deteriorating the metal by imparting to it the sulphur which most forge coal contains, and which causes red shortness in the iron, or, in ther words, rottenness when hot. At a meeting which they have just held, the subject was discussed. The discussion showed that in different ways the members had used limestone as an absorbent of sulphur, with varying results. Placed around the sides of the furnace in lumps the size of a man's fist, limestone had been found most successful where the pig iron puddled was of a lean kind. However, where good iron was being puddled the redshortness was not destroyed, but was actually communicated; and the puddled and merchant bar had the ragged appearance which is technically called spilly." In consequence limestone was now but seldom used in the puddling process. But it was the opinion of Mr. Healey, who has the superintendence of the blast furnaces of the Darlaston Steel and Iron Company, that if the limestone should be deposited over the bridge of the puddling furnace, or if applied to the coal as a solution before it was burned, then that more satisfactory results would be secured. Mr.. Healey instanced striking results which had followed upon the changing in the management of blast furnaces of the coke used. White iron had been the yield of the furnaces for a long time, and he wanted gray. His difficulty arose out of the use of coke, which, by and by, was found to be highly impregnated with sulphur. When for this highly sulphurous coke was substituted Staffordshire coal and coke, good gray forge iron was obtained from the same stone.

In a paper on economy in the use of coal, lately read before the Royal School of Mines, Berlin, we find the following synopsis of interesting historical facts: The progress in the economical consumption of fuel in the last 50 years has been enormous, and has been effected in great part by metallurgists; and here again we find the scientific men taking the lead. In the economical application of the heat developed by fuel the Bessemer process is enormously effective, not more than 10 lbs. of coal being requisite for the production of 1 cwt, of steel from pig iron by this method, while in the older process, still in use for fine qualities of steel, 250 lbs. are needed. Siemens, by making the heat which would escape through the chimney of an ordinary furnace warm the fuel and the respondents, and everything pertaining to the air necessary to combustion, obtains an economy of two-thirds the weight of fuel. It was Faber de Faure, an accomplished Bavarian metallurgist, who first made practical use of the gases which formerly escaped in immense quantitles from the tops of blast furnaces, and the enormous blast engines, the hoisting engines, pumps, and hot-blast stoves, even the roasting kiles of such establishments now-a-days require no fuel except this long-neglected waste product. Bischof, another German engineer and metallurgical author, was the first to produce gas artificially for smelting purposes, and this was certainly one of the greatest advances ever made in our art. By first turning it into gas, screws per minute, or 30 per cent, more than fuel can be much more perfectly consumed than in the solid form, and hence can be made the capacity of that department about 50 per to give us, as in the Siemens furnace, in which only gas is used, a much higher temperature sizes, which will increase the assortment than is practically attained by the combustion manufactured. Fifteen new "threaders" have of coal in the ordinary way; but perhaps the greatest advantage of gas is that substances in general scarcely regarded as fuel at all can be employed for the production of gas with the most brilliant results, a matter of the greatest importance, especially in a region destitute of true coal, like California. Lundin, a noted and thoroughly educated Swedish metallurgist, has taught us how to produce gas from wet sawdust, entirely without preparation, of such power that wrought iron may be melted with it, and the great difficulty is to find any material infusible enough to arswer as a lining in the furnaces where it is consumed. You will receive some idea of the importance of these improvements from the fact that the economy in fuel effected in England alone in the year 1872, as compared with 1871, by the progress made The firm of Parker & Adams, Capital City in the introduction of more perfect apparatus,

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Saws of all kinds.



Telegram Dated Oct. 1st, 1874. To HENRY DISSTON & SONS:

Philadelphia, Pa. I want you to publicly test that challenge on Cross Cut Saws. Name time and place within thirty days
American Institute preferred. E. M. BOYNTON.

E. M. Boynton gave on Wednesday of last weel an exhibition of what his Lightning Saw could do at the Pennsylvania State Fair, in which two mer sawed through a sound oak log, 16 inches in diame ter, in 17 seconds. Mr. Boynton informs us that his export trade is increasing, he having lately made large shipments of his saws to Australia and other distant markets.—The Iron Age, Oct. 8, 1874.

For fuller report of this exhibition see the Easton

Morning Dispatch of Oct. 1st, 1874. Henry Disston & Sons cannot furnish Lightning



Saws. Why do they imitate mine?

And Plastering Trowels, ROCHESTER, N. Y.

A large Stock of Cross Cut Saws constantly on hand. Orders filled promptly. Dietrich's Dauble Handle than Man Cross Cut Saw made with any kind of tooth desired. Our patent method of grinding Hand Saws makes them superfor to any in the market. Send for Illustrated Price List.



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The best Hoe in market. It will not batter or Bolles Hoe " or any Hoe in market

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Properly Hammered.—Great care is taken that Properly Hammered.—Great care is taken that saw shall leave my works without due attention in this important particular. A saw too tightly trained upon the rim, or too loose in the center, annot be successfully run—hence the importance of so hammering the saw as to effect equal strain all its parts, and at the same time RUN TRUE. This department is under the personal supervision of ayself, who has devoted over needy years to the art is saw making.

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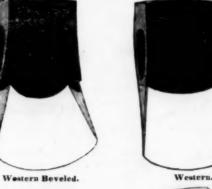


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break. Wears itself sharp. Will last twice as long as any other Hoe, and is warranted to cut the P. O. Box 2355. 81 Beekman St., New York.

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Pen and Pocket Cutlery, Solid Steel Scissors, F. & L. Shears, Razors, Russia Leather Strops, Oil and Water Hones, &c. Sole Proprietors of the renowned full concaved patent

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TABLE KNIVES AND FORKS OF ALL KINDS,



And the "Patent Ivery" or Celluloid Knife. These Handles never get loose, are not affected by hot water, and are the most durable knives known. Always call for the Trade Mark "MERIDEN CUT-LERY COMPANY" on the blade. Warranted and sold by all dealers in Cutiery, and by the MERIDEN

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The only Knives made that are put together in such a manner that there is no strain on the covering or frail part of the knife. We warrant our knives equal in cutting qualities and workmanship to any made, and are acknowledged by English makers as the Best American Knife. We also make

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Malleable Iron Castings Of Superior Quality made to order.

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Table & Pocket Cutlery, WARRANTED TO BE MADE OF THE BEST

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Handsomest, Cheapest, most Durable Cutlery in use. Wood's Celebrated Shoe Knives. Butcher Knives a specialty. WOODS CUTLERY CO., Antrim, N. H. CLARK WILSON & CO., Agents, 81 Beekman St., N. Y



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Fine Table CUTLERY. Cor. Nassau & Sheffield Sts.

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"DRAW CUT" Choppers, Hand and Power.
Stuffers,
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MURRAY IRON WORKS,

PHILADELPHIA CORRESPONDENCE.

PHILADELPHIA, July 5, 1875 Notwithstanding the near approach of the pational holiday, which generally puts a stop to all trade, there was a better feeling and more activity in financial and trade circles last week than for some time back. In stocks and bonds a great deal of this improvement is, no doubt, due to the increased confidence produced by the fact that the Reading Railroad Company contrary to general expectation, declared the regular quarterly dividend of 21/2 per cent. This dividend, it was expected, would be either entirely passed or reduced to 2 per cent., owing to the lessened receipts from the stoppage of oal mining. As it is, the stock market has improved, and the bonds of good companies are in request, as indeed is every other form of legitimate investment. There are also reported improvements in some departments of the iron industry, as among foundries, machine shops, and such branches. A local paper reports ome of these establishments with orders for a month ahead, and others as uncomfortably busy, which latter might readily be the case without any very great deal of work this hot weather. On all sides, however, the feeling prevails that we have reached the turning point, nd that with the fall months we will have a reasonably prosperous, if not large, trade. The most exciting topic of the week, however, and that which has created a great deal of discussion, has been the action of the assignee in the insolvency case of Henry G. Morris, late of the Southwark Iron Works, in filing a bill of complaint against Alexander Ervin, late financial manager of the concern, charging him with the mismanagement of and appropriation of funds to his own use, and also applying for an injunction against two national banks to prevent his withdrawnig funds, transferring stock, Ervin has in turn made a rejoinner through the press which, although the whole affair is a lamentable washing of dirty linen before the public, shows such a frightful state of business mangement, if as alleged, as to be worthy of the notice of the trade. Condensed of the legal verbage, the complaint of the assignee sets forth as follows: After reciting the facts of assignment, &c., it is stated that Morris, beginning business Jan. 1, 1871, employed Ervin as financial manager at a salary of \$6000 per annum, and that, thenceforth, Ervin had charge of this portion of the business and all private accounts, the general books being all private accounts, the general books being kept by a nephew of Ervin. That the principal, Morris, never examined the books, but received balance sheets from Ervin from time to time, now said to have been false, until in April, 1875, he found himself hopelessly insolvent with a loss of over \$1,200,000. An examination of the books after assignment by a competent accountant claimed them to have been kept in a ground irregular manner, that Ervin declined

loss of over \$1,200,000. An examination of the books after assignment by a competent accountant claimed them to have been kept in a grossly irregular manner, that Ervin declined to aid in this examination, and commenced action against Morris for a large sum claimed to be due. It further claims that Ervin received large sums from the concern which he never accounted for. That paper was made by Morris and given to Ervin to negotiate, which he never accounted for, and that he is indebted to the complainant near \$150,000 for such. The injunction against the banks is to prevent them paying to Ervin money deposited by Morris, in Ervin's name, to avoid attachment, and which Ervin refuses to account for. The complaint is much fuller than we have related, refers to investments by Irvin of funds belonging to Morris, in real estate and stocks, and describes the various acts of malfeasance in detail. As stated, it shows a lamentable state of affairs. Ervin's rejoinder as given, on being interviewed, is much the most interesting, however, to the trade, as it shows the actual conduct of a manufacuring business with which they are concerned. His history is as follows, viz.: That at the close of 1869 Mr. Morris withdrew from the firm of Morris, Tasker & Co., with a little over \$700,000, represented by three mortgages of about \$240,000 each, which were sold at near 10 per cent. discount. After losing some \$100,000 in private speculations, Morris bought the Southwark Foundry from Merrick & Sons, in December, 1870, the price of the real estate being \$580,000, and personally \$75,000, on which \$40,000 each was paid, \$76,000 in Morris notes, maturing during 1871, and morrigages for the balance payable annually during ten years, save for \$100,000 left on ground rent. Expenditures of \$200,000 are diditional buildings and machinery were subsequently made. This about absorbed, according to Ervin, Mr. Morris notes, and left no cash capital. In July, 1871, Morris obtained Ervin's accommodation notes for \$40,000 and in hargust and Septembe Ervin, and that \$40,000 additional of accommodation paper is still out. Ervin claims that Morris' misfortunes arose almost wholly in the manufacturing department. "Nearly every contract taken during a period of four years will be shown to have occasioned a net loss." These are instanced as follows, viz: An engine and boiler for the Lowell Water Works at \$64,000 cost the works \$80,000; an engine for the Crane Iron Co. at \$28,000 cost to make nearly \$50,000; three sugar machines for Peru at \$550,000, less 15 per ceut. commission (a nice brokerage, by Ervin, and that \$40,000 additional of accomm

successfully with Great Britain for bridges in Canada, South America and India; and always and ever preserving an unshaken credit in the market, even when the strongest firms were asking accommodation and extension. We have never had in Pennsylvania such a flasco in the iron trade as the trial of the case of the asnave never had in Fennsylvania such a flasso in the iron trade as the trial of the case of the assignee of Morris against Ervin will be, and for the credit of our industry it is to be hoped we never will again. The transactions when brought out under oath in court will, no doubt, be of interest, as showing the cause of some other failures in this line during the present season.

season.

The incidents of the week must be omitted for want of space. The Committee of the Iron and Steel Association to collect ores for the Centennial have, as you no doubt publish elsewhere, resolved to cease all attempts to that end, and ask to be discharged. This is very unfortunate, but still time enough remains, by active work in the respective. States to make a active work in the respective States, to make a creditable display at the Exposition.

The Safe of the Cumberland.

A correspondent of the Baltimore American sends the following from Norfolk, Va., about the safe of the man-of-war Cumberland, reently raised :

The iron safe lately taken from the wreck of the ill-fated United States man-of-war Cumberland, run into and sunk by the Confederate ram Merrimac in Hampton Roads in 1861, is now on exhibition in this city. It is an oldfashioned concern, square, about the size of a common size tea chest, and built of east iron. When found it was lying on its side, buried in about four feet of mud on a deck next to the one where it stood when the ship went down. Rust has eaten through it in several places, and there is an opening on its side about three inches wide, caused, it is supposed, by the explosion of a torpedo. It is said that through this opening a shower of nearly \$8000 in gold coin marked the track of its ascent from the wreck to the schooner. None of it, of course, can ever be recovered, as the water there is nearly one hundred feet deep and the tide very swift. The parties who have the safe are silent in regard to its contents, and are not likely to tell the amount of its treasure, but it. is confidently believed that there banking account has been increased about \$75,000 in gold. Fully this amount has been expended in the various vain endeavors to find it before these parties undertook the job. One company alone, at the head of which was Ex-Governor Gilbert C. Walker, is known to have sunk \$25,000 in the fruitless enterprise. It is now known that those who formerly searched for this money were many times either standing on the very spot or very near it, and had they known it could have easily put their hands on it. The deck around it had been shattered and the safe itself been partly blown open by torpedoes being exploded beside it.

While Captain Brown was searching for the spot where he supposed the safe to be he stumbled against what he supposed to be a log of wood, but what he subsequently was horrifled to find was the ghastly remains of a man, hardened and petrifled into stone, standing solid and erect-a lone sentinel, watching as it were the treasures of the deep, surrounded by the bones of his lost comrades who died with him while vainly and nobly battling for the preservation of their good and beloved old

It was when endeavoring to raise this strange object out of its grave of mud he found the the safe, which was immediately taken up and brought to Norfolk. Brown has been a most uccessful diver, having performed many dangerous and difficult operations of this kind, both here and in England. O. E. C. Maltby, who employs him, and who gets the bnik of this money, is a merchant of this city, and is largely engaged in wrecking operations in all parts of the United States. He will, doubtless, put the gold where it will do the most good.

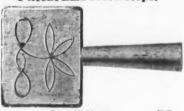
Several suspicious characters, attracted here, it is supposed, by the announcement that the safe would not be opened until the arrival of certain interested Detroit parties, have been put under the surveillance of the police. Three of them, two nights before the safe was opened, were found secreted in the back yard of the Atlantic Hotel, where the safe is kept, but made their escape before they could be arrested. It is the intention of Mr. Maltby to present the safe, with other valuable curiosities taken from the wrecks in Hampton Roads, to the Massachu setts Historical Society, in time to be exhibited at the coming Centennial celebration.

Building a House in Eight Hours .-The San Francisco Scientific Press says: The

tron Co. at \$25,000 cost to make nearly \$50,000; three sugar machines for Peru at \$550,000, less 15 per ceut. commission (a nice brokerage, by the way), cost nearly \$600,000 to make; a stand pipe for the Bristol Water Co. at \$5500 cost \$7000, just an hundred per cent. the wrong way. Another heavy loss was that of constructing a gas works for Secramento for \$225,000 in the stock of the company, since unavailable, in consequence of litigation. To cover such enormous losses, Ervin adds: Morris proposed speculations, "one of which was a large venture in pig iron in 1872," to which he Ervin, gave all his "time, talents and energy," and was to receive haif the profits. Under this arrangement upward of 50,000 tons of iron were bought and sold, purchases averaging \$37 to \$38 per ton, and sales \$51 and \$55 per ton, the net profits on which, after unusual expenses, amounted to some \$600,000. The remainder of Mr. Ervin's statements are chiefly comprised in a general denial of indebtedness and mismanagement, and a desire to meet a full investigation. With this the trade at large has nothing to do, but the facts as above given, if true, and they have been matter of gossip for months before the failure, are a sad commentary upon the management of such a works as the Phenix Iron Constantiation, and every advantage of locality and a good trade already made, a world-wide reputatation, and every advantage of locality and facilities, steadily progressing to the bad; and that of such a works as the Phenix Iron Constantiation, and every advantage of locality and facilities, steadily progressing to the bad; and that of such a works as the Phenix Iron Constantiation, and every advantage of locality and facilities, steadily progressing to the bad; and that of such a works as the Phenix Iron Constantiation, and every advantage of locality and facilities, steadily progressing to the bad; and that of such a works as the Phenix Iron Constantiation, and every advantage of locality and facilities, steadily progressing to the bad; and that o rapidity with which American mechanics turn off work is a marvel to foreigners. This fact is true even when we leave out of the question the more general introduction of machinery for hand labor in American shops. We have a letter before us, just opened as we write, from a French speaking German, who is having a machine made in Paris, from the same drawings used in the construction of a similar machine in San Francisco, where he complains bitterly of the tardy progress made on account of the slow mode of manipulation there. The same is true of all European countries. there forms, comparatively, but a small factor, in turning out a job of work, while here it is a most important essential in all jobs or contracts. We are led to this remark on perusing the letter above referred to, just previous to our eye falling upon the following item from the American Manufacturer : Last year Dr. A. Mishler erected in Lancaster City, Pa., a twostory brick house in 19 hours. He now proposes to build on the Centennial grounds, in Philadelphia, next summer, a two story brick house, 24x40 feet, in eight hours! He has arranged with Capt. Geisinger, of Reading, for the furnishing of the cornice and door and window caps, which will be of galvanized iron. The Captain will be allowed half an hour in which to put up the cornice, though he thinks

H. D. SMITH & CO., PLANTSVILLE, CONN.





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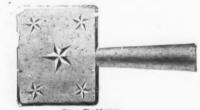


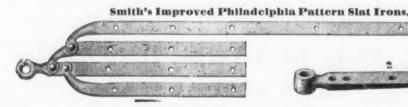
Established 1850.

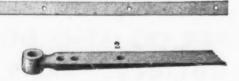


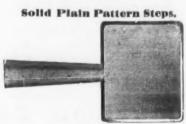
1871 Pattern Shaft Couplings.











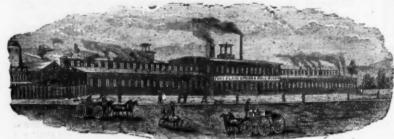
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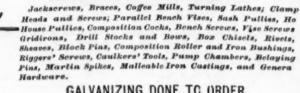
Best Bolt manufactured for all kinds of agricultural machinery. Will not split the wood, and can not MANUFACTURED BY

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HOOPES & TOWNSEND.

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Cold Punched Square & Hexagon Nuts,

Washers, Rivets, Wood or Lag Screws. Chain Links, Truck and Car Forgings, Bridge Bolts, Bridge Forgings.

IRONS AND RODS FOR BUILDINGS.

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PHILADELPHIA

Philadelphia Star Bolt Works.

"STAR"

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NORWAY IRON.



"STAR" Axle Clip. All Styles of

FANCY HEAD BOLTS.

Blank Bolts, Skein Bolts, Square Head Bolts, Plow Bolts, &c., &c., &c.

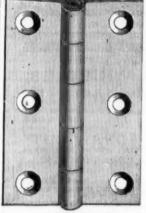
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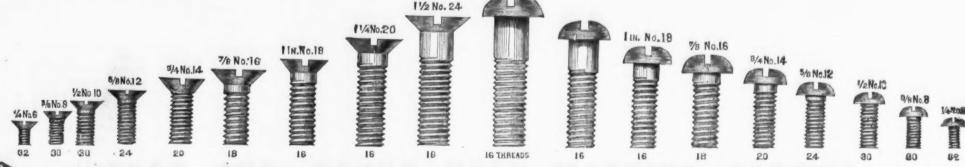
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NEW YORK, January 2, 1875. Until the 1st instant the postage on newspapers was paid by subscribers at the office where the paper was received, the yearly rates on the diffe editions of The Iron Age being as follows: Weekly, 40 cents; Semi-Monthly, 40 cents; Monthly, 24 cents.

Under the provisions of the new postal law, which went into effect on the 1st instant, prepayment at the office of mailing is required, at the rate of two cents per pound for the Weekly, and three cents per pound for the Semi-Monthly and Monthly, which will make the postage as follows on the different editions: Weekly, 50 cents; Semi-Monthly, 30 cents; Monthly,

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Why England Suffers from Foreign Competition.

In the concluding part of Mr. Isaac Lowthian Bell's paper on the Coal and Iron Mines and Iron Works of the United States, which appeared in our issue of last week, occurred the following passages, which we did not at the time have space to comment upon

to comment upon:

In The Iron Age of 22d October of last year, an ably conducted journal, dealing especially, as its name would indicate, with the metallurgy of iron, is an article entitled "Why England Sunters from Foreign Competition."

The chief reason why we suffer, according to this authority, is, that we are no longer able to command what the writer designates as "pauper labor," and this so-called pauper labor has caused British manufacturers to neglect keeping pace with the progress of the times, which neglect has led to our overlooking to afford any "encouragement to inventive talent to devise ouragement to inventive talent to devise

bor saving machinery."

If this language is intended for the British

imperfectly acquainted with the real circumstances of the ease, for, in his comparison, he draws a distinction between the Contanent of Europe and our own island. When I say that Europe and our own island. When I say that the rates of wages are at the present moment, and in last October were, and always have been, much higher with us than in any iron making center on the Continent, I am merely stating a fact which has been remarked and commented on by every writer on the subject for the last 25 years. To the statement that "labor saving machinery" has been neglected, I have only to observe that the extent to which, in spite of higher wages, we reduce our expenses of manufacturing to the level of the cost of our neighbors, has been the subject of admiration to every Continental iron master who has visited every Continental iron master who has visited our furnaces and mills. Indeed, and this, perour furnaces and mills. Indeed, and this, perhaps, will carry more weight with *The Iron Age* than French or German approbation, some of my American friends have considered it expedient to introduce in the most recently erected blast furnaces some admirable lessons they generously admitted they had learnt in England.

Mr. Bell is entirely correct in what he says concerning English and American engineering practice in the construction of blast furnaces intended for certain kinds of coals: it does not follow, however, nor do we admit, that we were wrong in what we said in the article of October 22, 1874, Issued every Thursday Morning. Contains full to which he alludes. What we said at that time referred entirely and exclusively to those branches of manufacturing largely carried on by hand labor in Great Britain, but which in this country are very largely carried on by means of improved laborsaving machinery. To set ourselves right with our readers at home and abroad, who may infer from Mr. Bell's remarks that we have drawn comparisons between English and American blast furnaces unfavorable to the former, we cannot do better than quote from the article in question :

During the whole period of England's history as a "workshop" for the manufacture of goods for export, labor has been kept in a condition verging so closely upon pauperism that only those in the enjoyment of robust health, and with the advantages of enough early training to give them a measure of skill which could be made usefol, were able to keep themselves and their immediate families and dependents above the necessity of receiving public sid. In a country overcrowded with what has truly been called "pauper labor," the competition for work among those seeking employment enabled manufacturers to keep the standard of wages at so low a figure that the laboring classes had no chance to better their condition in any material degree. It was a species of slavery from During the whole period of England's histor no chance to better their condition in any material degree. It was a species of slavery from which capital profited for a time, but which, in the end, has imperiled the very existence of those great industries in which capital has found investment. Depending upon cheap labor, British manufacturers have neglected to keep pace with the progress of the times. Their workmen in many branches of manufacture follow the methods and processes employed by their fathers and forefathers for generations past, and there has been but little encouragement to inventive talent to devise labor-saving machinery, for men were cheaper couragement to inventive talent to devise labor-saving machinery, for men were cheaper than machines. This dependence is now failing them. * * The British manufacturer must pay as much for labor as his Continental competitor, if not more, and he requires a great deal more hand labor to accomplish a given result. He is half a century behind the manufacturers of the United States in the adaptation of machinery to manufacturing, and at least fifteen or twenty years behind three of the manufacturing countries of the continent. But even with the best labor-saving appliances, he would still be at a disadvantage as compared he would still be at a disadvantage as with those of other and more progressive countries. His workman cannot at once adapt themselves to the changed condition of affairs in which they find themselves placed. Nor do they want to. The prejudices imbibed and habits acquired by successive generations, through centuries of poverty and ignorance, are not easily set aside or forgotten. The battle between men and machinery must be fought over again before labor and labor-saving machinery can be made to co-operate for the general good, and years will pass before this result can be effected. Great Britain is only now beginning to pay the inevitable penalty for the with those of other and more progressive coun suit can be effected. Great Britain is only now beginning to pay the inevitable penalty for the crime of keeping her working classes in igno-rance and poverty, that the few who shared her vast accumulated wealth might wring from them the largest amount of labor for the least amount of wages.

The portion omitted at the point indicated by asterisks is unimportant, re lating only to the methods of organization by which British workmen have succeeded in advancing wages to the present comparatively high average.

Now, we think that our statement of the easons why England suffers from foreign competition to the extent of a loss of many of her foreign markets for manufacturesnotably those of the United States - are correct, and that they will stand the test of careful and impartial examination. It is the universal testimony of all who have had opportunity of making comparisons, and Mr. Bell will admit its truth, that the machinery used in British workshops and factories is vastly inferior to that employed in similar establishments in this country. With labor abundant to excess, and cheap in proportion to the activity of competition for employment, the British manufacturer has been able to produce profitably by processes of hand labor, which would have ruined the American manufacturer dependskilled labor. Men there have been so cheap that there was much less incentive than here to substitute machinery for hand some of the more enterprising continental countries, have made more rapid progress, and the fact was not known until the effects were feit in a growing foreign competition, from the effects of which the English export trade has suffered heavily in the vast variety of sizes, varying from 8 inches markets which have hitherto been most profitable.

precarious employment and low wages able to place upon a single wheel. have kept the English working classes

refer our readers to the Parliamentary blue official inquirers into the condition, social Great Britain. We have not space at this nearly the point of most frequent breakage. time to quote from their reports, but they Perfection in manufacture and the increase show a condition of affairs among the in size had made broken axles of the stan-Kingdom which could not be found in this country even in times of severest in- of a new axle is exceedingly rare. Now, dustrial depression, and which we do not think can be found in any other because steel is so much stronger than iron country of Europe. It is stated on high statistical authority that not more than one-third the working population of England secures continuous employment, ing already a sufficient strength. The and that at least one-third were continually in receipt of charity from some source. We do not think it possible for any nation to build up a substantial material prosperity upon any such foundation, and if England declines to a second rate position among the producing nations, it will, we think, be because the masses of the people have not than the strength of the metal. shared, in proportion to their needs and requirements, in the benefits of the past century's progress in civilization. The education and elevation of her working people is all that will save to England her present condition by means of organizations to force unwilling concessions from the classes above them in the social scale, the British workingmen have gone to dangerous exesses, it is because they do not know any better; but they are fast learning things well to know, the outflowing current of emigration is reducing the numbers of those competing for employment in the mechanical trades, and without some other dependence than cheap labor, Great Britain must fall behind in the competition with other manufacturing nations. We have, as Mr. Bell says, much to learn from the British iron masters, and they should be honored for the generous manner in which they have given and are giving the world the benefit of their experiments and experiences in furnace construction and management; but those who manufacture iron into the thousand articles of utility into which it enters, speaking generally, have much to learn from manufacturers in the same trades in this country, especially as regards the employment of labor-saving machinery.

Steel Railway Axles.

Some tests of the comparative strength of steel and iron railway axles have recently been made in this city and else where, and accounts of the results have been going the rounds of the newspapers for some time past. These tests consisted in dropping weights from various hights upon the centers of the axles, and noting the deflection under such blows. In some cases the axles were turned between the blows and received the weights on opposite sides. As was to be expected, the steel axles were far ahead of the iron, but it is to be noted that the steel axles were sent to the test by a firm who manufactures steel axles, who built the testing apparatus, and who, in fact, seem to have suggested the experiments and carried them out. The steel naturally had a good record, while the iron made a very poor showing. Most of the papers which have copied this item have drawn from it the conclusion that, because steel is stronger than iron, it should be used for axles in the place of the iron. If tests by means of weights subjected an axle to strains in any respect similar to those it encounters in actual service, the results might be conconsequently, they are practically valueless as determining whether steel is, or is not, a better material than iron for this use.

It is a cause of much surprise to many that steel has not long ago replaced iron as a material for axles. It has from time to time been tried on railroads and each time abandoned. The reasons for this may be stated in a few words. In ordinary freight service we have a load of from three to four thousand pounds to each wheel: on passenger cars the load is sometimes larger, but even the weight of 3000 lbs. to each journal is too often found in practice to be more than the journal can carry without becoming hot. It is also found that the journal must have its size lubrication, as by those of strength. 31/8 inch journal often carries its load, and probably has a considerable margin of labor, consequently the United States, and safety, but the question of hot boxes is one of even greater importance than the strength of the journal, and the sizes have been gradually increased. The Master Car journals, while there are in common use a upward to four. Above 31/4 inches the strength of a good hammered axle seems With regard to the condition in which ample to carry any load which it is desir-

In order to get the journal with the col-

wheel seat is set about 4% inches in diamroads using the smaller size the breakage our contemporaries would persuade us that that the iron should be abandoned and of the fact that size is what we want, havbreaking of any axle is a accident of rare occurrence, usually traceable to defective turning, a hot journal, or other preventible cause. We should gain nothing in safety from the use of steel, while the cost of the being determined by considerations other

Steel axles have been placed under cars with whom we are acquainted, and in each greatness. If, in undertaking to better their fact, although we do not know the reason for it. At all events, it has been shown that a steel axle could not be safely given diminished danger from conflagration. a smaller diameter than is now considered necessary with iron, while the probabilities are it would have to be somewhat larger. Under these circumstances we fail to see where the advantage would be of using steel instead of iron.

Instead of attempting some impracticable thing of this sort, if the gentlemen would turn their attention to the use of steel for the equalizers of passenger trucks, they would be working in the right direction. because the common iron equalizer is weak in proportion to its weight. A strong light bar in the place of the one now used would really be a valuable thing. Our opinion is that the steel men had better give up the idea of the steel axle for cars, and turn their attention to the various parts of cars, where more strength, with less weight, are wanted.

The Industrial Uses of Paper.

In view of the rapidly increasing use of paper in the arts, and of the great number and variety of articles now made from it, velopment, which will be appropriately fairly begun, we might conclude that paper was about to claim this honor, hitherto accorded only to stone, bronze and gold. of paper for metal is in the article of cans. As it is, iron must in future share with cesses in which it is now considered indispensable. It is gratifying to know, howimpervious to water.

to the stiffness of the skin, they are made paper used for this purpose. very light. In a word, paper boats are

substituted for wood, we may mention each year finds the quantity used greater manufacturers of iron, its author must be but through many generations, we need only lar through the eye of the wheel, or axle water pails, which are manufactured in and the range of uses increased. This in-

seat, the eye must be made considerably large quantities. These are now made books in which are given the results of larger, so that in the standard axle the without seams, and for many purposes are excellent. All that is needed to perfect and moral, of the laboring population of eter. This great diameter comes at very them is a good enamel, which shall be insoluble in water, hot or cold, and shall resist grease and the dilute acids commonly encountered in culinary operations. Of artisan classes of many parts of the United | dard size an unknown thing, while on those | paper barrels, several different styles are made, chiefly without seams. They are used for flour and other dry substances, and paper casks have been made which hold oils and other liquids. Paper has also been employed to some extent for steel substituted, and this, too, in the face door panels, a use for which it is admirably adapted. We have also seen whole doors made from it, and as it neither shrinks. warps or cracks, doors and panels made from it stand long and hard usage, with variations of temperature, better than wood. We have also seen paper table tops, beautifully finished with enamel, and winaxles would be greatly increased-the size dow shutters which possessed the advantage over wood of being practically fireproof. There are many other uses of paper in which it is substituted for wood, and its on several different railroads by gentlemen employment is daily becoming more varied. It is not impossible that within a quarter case they were abandoned on account of of a century paper will be largely emtheir liability to heat. We know this as a ployed in the construction of all kinds of buildings. As it is very difficult to burn it, we shall gain something from its use in

> The substitution of paper for metal has been even more extensive. One of the most important of these applications is the use of paper for car wheels. The reader must not suppose that the whole wheel is of paper. On the contrary, the paper wheel has an iron hub and steel tire, and sides closed in with discs of boiler plate. The paper is used solely to act as a cushion and absorb the jar and concussion produced by the wheel upon the rail, and break the metallic contact by which the concussion would be transmitted to the body of the car. Various substances have been used for this purpose, but nothing, so far, seems to answer so well as the solid blocks of paper with which the whole wheel from hub to tire is filled. The endurance of these wheels is enormous, far surpassing that of steel tired wheels of the ordinary patterns. The paper blocks and the metal plates between which they are held can be used over and over again; in fact they practically do not wear out, and will outlast several steel tires. It is now some six or seven years since the first set the question has suggested itself to certain of paper wheels were made, and if we are inquiring minds whether we are not about not mistaken those wheels are not worn out entering upon a new era of industrial de- yet. Certain it is that the wheels made soon after are in good running order, and styled the paper age. Were it not that iron it would not be safe to say that they will has stamped its imprint upon the age just wear out at less than 400,000 miles run, and very possibly much more.

One of the most remarkable substitutions

When visiting the works of E. Waters & paper, as in the past it has shared with Son, at Troy, the makers of the paper wood, the greatness imparted by its almost boats, we were shown a closed paper universal industrial utility. The world's cylinder capable of holding something like supply of timber is disappearing so rapidly five or six gallons. Careful examination that another generation will probably have by the sense of smell failed to show the to dispense with it in many industrial pro- faintest indication of the character of its contents, yet there was evidently some fluid contained in it. The reader can ever, that paper stands ready to take its imagine our surprise on unserewing the place; and not only this, but to give us stopper by which it was closed to find it a very convenient substitute for metal in filled with kerosene, and that it had held articles which need to be light, strong and ts contents without a trace of leakage for some eighteen months. We have never In the substitution of paper for wood, seen a metal can as tight and, to all apwe find, first, paper boats, which, in every pearances, as durable. In the matter of essential point, are far ahead of wood. weight and stiffness it far surpasses metal. The paper used is of two kinds, one being The material was straw paper. Water employed for racing boats and the other pipes have for a long time been made in for common boats. The racing boat is California from paper of a peculiar charsidered as conclusive; but they do not; made of a thin, strong, tough manila pa- acter. They are of considerable size, and per, so prepared in the manufacture, or so from the accounts which we have now and made, that it will not split. Sheets of this then received of them, we judge that they paper covered with shellac, and stretched are chiefly used for hydraulic mains, where over a proper mold, are united to each great strength and durability are required. other by melting with a hot iron the shel. They are coated with a preparation of bilac, which not only penetrates the pores of tumen or asphalt. Ewers, basins, pans, the paper, but cements the layers to each tea-trays, cuspadores and various kitchen other till they form a solid body of the and bedroom articles are made from paper same shape as the mold upon which they or paper pulp pressed in molds. One of have been placed one after another, each the most valuable, perhaps, of this class of sheet being cemented to the one previously goods is the baths and trays for photoapplied by the ironing process. For more graphers. Usually these are made from common and less expensive boats, a very porcelain or glass, and when large are not heavy sheet of pulpy paper is placed wet only expensive but brittle, and form a conupon the mold, and allowed to dry in that siderable tax upon the artist. The paper position. When dry it is as hard as a baths, however, have been very highly board, or as very stiff and dry leather. esteemed, as they are cheap, strong and ing upon a precarious supply of high-priced determined as much by the requirements of The pores are then filled with shellac light, while they are very durable. Upon and finished by rubbing down and varnish- the miscellaneous uses of paper alone an ing until the desired surface is secured. article could be written. These uses seem These boats are marvels of lightness and to be endless. Among them we may menstrength, the great toughness of the paper tion one application, which is perfectly permitting the construction of large boats enormous—the paper cuff and collar. It with skins very much thinner than would would be almost useless to attempt to guess be possible with any other material. The the millions which are worn and thrown Builders' standard axle has 3% inch ribs and mountings are of wood, but owing away each year, or to estimate the tons of

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What the future is to be is even beyond stronger, lighter and, because of these the power of the most vivid imagination qualities, better modeled than wooden to paint. There is scarcely an industry in the whole country which does not at the Among other articles in which paper is present time use paper in some of its forms; crease in the range of its application is not observed by the general public, since it is so general as to escape observation, except when particular attention is paid to the subject. We may look in the future for a very general substitution of paper for wood in a vast number of cases. As wood increases in value, this substitution will become more and more rapid. Within the memory of men now living, perfectly clear pine lumber sold in New York city for \$10 per thousand, now such lumber cannot be bought here for money, and the nearest approach to it costs anywhere from \$70 upward, according to the quality. It is safe to suppose that in the next 50 or 60 years there will be a still greater proportionate increase in the price of timber, and hence we must have some material to take its place. Metal cannot do this to any considerable extent, because it is not sufflciently strong for its weight, nor is it as elastic as wood or paper.

The sources of the paper supply are boundless. At the present moment, paper is made from only a tithe of the substances available for the purpose, and known to the paper makers, while there are, in all probability, thousands of other sources still untouched. It seems as though almost any fibrous material can be turned into paper, so that though our timber may disappear we still have a substitute for it in paper.

End of an Important Stove Suit.

The decision of the Supreme Court of the United States in the case of Perry vs. Littlefield and Jagger, carried up on appeal of the defendants from the U.S. Circuit Court for the Northern District of New York, where it was tried and decided for the plaintiff, in October, 1874, has just been given to the public.

The facts of the case may be briefly summarized as follows: The plaintiff, Mr. John S. Perry, of Albany, by mesne as signments, became owner of certain terri tory of the rights under a patent granted to Littlefield, the defendant, who was charged with infringing his own patent by selling the patented articles, stoves, in the territory assigned to the plaintiff. The defence was that the grant by which the plaintiff derived title was only a license, and did not entitle Parry to sue, since the grant provided, in connection with an accompanying agreement, that royalty was to be paid to the patentee by the grantee, and that certain styles of stoves were reserved to the patentee in the territory transferred, and that provision, moreover, was made for a lapse of the grantee's right in case of non-fulfillment of the terms of the agreement. The Supreme Court held, in harmony with the lower Court, that the grant in question was in the nature of an assignment, and that even if it was not technically an assignment, equity would cure the defect. The patentee usually protects his license; in this instance, however, the patentee was the infringer, and a license would be powerless against him. The sale of the infringing article was not denied, and a decree was therefore rendered for the plaintiff.

The text of Chief Justice Waite's opinion, which comes to us in full in the Official Gazette of the United States Patent Office, is somewhat too long to be given in full in our columns, but as the case is one of national interest as involving important points of law relating to the transfer of territorial rights to sell patented articles, we give the following synopsis, which is the rulings of the Court thereon:

The power of assignment under the statute The power of assignment under the statue has been so construed by the courts as to confine it to the transfer of an entire patent, an undivided part thereof, or the entire interest of the patentee, or undivided part thereof, within and throughout a certain specified portion of

and throughout a certain specified portion of the United States. One holding such an assignment is an as-signee within the meaning of the statute, and may prosecute in the circuit court any action that may be necessary to protect his rights un-

While a mere licensee cannot, in his own While a mere licensee cannot, in his own name, sue strangers who infringe, yet he would be permitted in a court of equity to bring suit against the patentee for the infringement of the rights secured to him by his license.

An agreement to account and pay a specified royalty, contained in an instrument of assignment, forms part of the consideration of the assignment, and does not reduce the grantee to the resisting of a licensee.

the position of a licensee.

Neither does a clause of forfeiture for non-

Neither does a clause of forfeiture for non-performance, contained in an assignment, re-duce the grantee to the position of a licensee. For the non-payment or other non-perform-ance a forfeiture may be enforced as for condition broken, but until it is enforced the title granted remains in the assignee. Where the patentee, Littlefield, under letters patent relating to stoves, executed with Tread-well and Perry a "grant" and a "supplemental agreement" on the same day, by the former of which, for the consideration therein named and of the agreements contained in the supple-

and of the agreements contained in the supple mental paper, he made conveyance of an allute interest in his patent for a speci

rights.

An assignment of an imperfect invention, with all the improvements upon it that the inventor may make, is equivalent in equity to an assignment of the perfected results. In such case the assignees become in equity the owners of the patent issued upon the invention when perfected, and, if the assignor takes the legal title he holds it in trust for them, and should conver.

convey.

In a contest between an assignor in equity and his assignee a court of equity will give the same effect to an equitable title that it would to one that was legal

one that was legal.

Where the patented improvement formed a part only of the infringing stoves made by the defendants, the inquiry in the accounting before the master should have been confined to an account of the profits received by the defendants as the direct result of the improper use of the improvements, and could not include all the profits received from the manufacture of the stoves emprecing such improvements.

stoves embracing such improvements.
In cases of infringement the profits actually realized, without interest, are usually the measrealized, without interest, are usually the measure of unliquidated damages. Circumstances may, however, arise which would justify the addition of interest in order to give complete indemnity for losses sustained by willful infringements.

This decision lays down the law very clearly. Those of our readers who desire the decision in extenso can find it in the Patent Office Gazette of the date above mentioned.

Since the fall of Maximilian and the restoration of the republic in Mexico, the progress of that country has been rapid and sustained. Among the important undertakings successfully prosecuted during the past few years we may mention the finished two years ago. Another importing the officers of the Arctic vessels, patent steel tant line is to connect the city with the wire rope for use in the place of their large frontier of Texas. While communication hawsers. The rope submitted was 120 fathom has thus been facilitated, the mineral re- long, 21/4 inch circumference, and was coiled sources of the country are being rapidly developed. Old silver mines, abandoned since the dominion of the Spaniards, have been cleared of water and worked. Coal, cinnabar, copper and even plumbago and tin have been discovered, although con-times the space, which in cold weather will be cerning the latter we have yet to receive frozen and quite unmanageable, where the 23 detailed and trustworthy accounts. About inch steel wire rope is so pliable that it works plumbago the particulars are to hand, and well through 12 inch or even 10 inch blocks. we refer to our general foreign reports. Hitherto Austria and Ceylon have been the only countries in which plumbago has been found in large quantities, especially the latter. Recently, however, it is obtained in Mexico, and if the reports of its abundance are confirmed, it will prove a most valuable article of exchange between Mexico and the United States, since, next to England, we are the most extensive consumers of it. Much will, of course, depend on the quality, the better grades of Ceylon being very nigh perfect, and adapted to many important uses in our indus-

Scientific and Technical Notes.

A correspondent in one of our exchanges gives the following account of the

OXY-SULPHUR LIGHT, and the method of making it: We had a small sheet iron retort of the usual conical form. The delivery tube we loosely plugged to act as a safety valve, if necessary, and in the lid we drilled a hole and screwed four inches of quarter inch brass tube. Through a hole in the side tube, closed by hammering the end, and having the closing pierced by a fine hole. By this arrangement we had the larger tube in communication with the interior of the retort and in the center of that tube, and rising a little bigher than the level of its mouth, a smaller tube coming out at the side and long enough to enable a rubber tube to be attached-an arrangement, izes. The end of the smaller tube was attached to the oxygen bag-one containing 4 cubic feet -and a 14 pound weight applied, which was found amply sufficient. When the vapor of sulphur made its appearance, the oxygen was turned on, and the result was a steady flame of about 2 inches in length, and of such intensity that, although we had not an opportunity then of trying it, we are sure a small statuette could have been photographed by it in a few seconds. The product of combustion-sulphurous acidmay easily be got rid of if there be in the room a suitable chimney; but even without that, there is no difficulty in rendering it so harmless that the operation may be carried on in a drawing room.

A good deal of interest is felt at the present time in the

STEEL WIRE ROPES

which have recently been fitted on a number of weighing 12 cwt. to 120 fathoms, towed from Liverpool to Plymouth, H. M. iron-clad, Caledonis, of 6832 tons, without any injury to itself whatever, when a 13½ inch hemp hawser, weighing 45 cwt. to the 120 fathoms, and the 1½ inch stream chain, weighing 130 cwt. to the 120 fathoms, broke and proved quite incompetent for these purposes. Her Majesty's ship, Valorous, had been fitted with 150 fathoms of the 5 inch circular steel wire rope for use, in the place of her 1½ chain cable, the former mental paper, he made conveyance of an absolute interest in his patent for a specified territory, said deed being duly recorded in the Patent Office, while in the supplemental agreement it was stipulated that nothing contained in the grant should give the grantees the right to use the principle of the patent in furnaces erected in cellars, &c., which supplemental paper, was never recorded: Held, that the "grant" was to be treated as an assignment, and that the grantees and those claiming under them

whatever, when a 13% inch hemp hawser, when a 13% inch hemp hawser, when a 13% inch hemp hawser, and that 120 fathoms, and the 120 fathoms, troke and proved quite incompetent for these purposes. Her Majesty's ship, Valorous, had been fitted with 150 fathoms of water on top of the rock, although only 8 fathoms were called for. An official exsisting the salight difference. But the 120 fathoms, broke and proved quite incompetent for these purposes. Her Majesty's ship, Valorous, had been fitted with 150 fathoms of water on top of the rock, although only 8 fathoms were called for. An official exsisting the 120 fathoms of water on top of the rock, although only 8 fathoms were called for. An official exsisting the 120 fathoms of water on top of the rock, although only 8 fathoms were called for. An official exsisting the 120 fathoms of water on top of the rock, although only 8 fathoms were called for. An official exsisting the 120 fathoms of water on top of the rock, although only 8 fathoms were called for. An official exsisting the 120 fathoms of water on top of the rock, although only 8 fathoms were called for. An official exsisting the 120 fathoms of water on top of the rock, although only 8 fathoms of water on top of the rock, although only 8 fathoms of water on top of the rock, although only 8 fathoms of water on top of the rock, although only 8 fathoms of water on top of the rock, although only 8 fathoms of water on top of the rock, although only 8 fathoms of water on top of the rock, although only 8 fathoms of water

when recently brought up at Portsmouth she, by accident, let go a foul anchor, getting a and, being larger, much more difficult and exturn of the steel cable round one of the arms. The anchor then took the ground, with the other arm uppermost, and, as she swung to the tide, took each tide one turn of the steel hawser round the other arm of the stock, and when she hove her anchor to the bows they found nine turns hove hard on to the iron stock (in the largest part 6 inches in diameter). Two men were able to take these turns off. and, to the surprise of all, the steel cable did not appear the least injured; but, although there was no appearance of injury, it was thought by some probable that, if any heavy strain was put on it might show some injury had been sustained by this severe trial. Messrs Bullivant & Allen, therefore, it appears, obtained the consent of the Admiralty to cut off the end of the steel wire cable that had been round the arm of the stock, and on Saturday in the presence of Admiral Sir Leopold M'Clin tock, Captain Nares, Commanders Markhan and Stephenson, of the Arctic vessels, Alert and Discovery, Captain Polkinghorne, of Ports mouth Dockyard, Captain Cumming of the troop ship, Euphrates, Captain Jones, of H. M. S. Valorous and several others of the Portsmouth Dockyard, and the officers of the Arctic vessels, it was tested at the Portsmouth Dockyard testing machine, and it took 69 tons strain, and then only three strands parted, showing that it had not sustained the slightest injury. The proof strain of the 1% inch chair cable, in place of which this steel wire cable is used, is 42 tons. Messrs. Bullivant & Allen also submitted for the approval of Admiral Vera Cruz and City of Mexico Railroad, Sir Leopold M'Clintock, Captain Nares, and upon a reel occupying, with the 120 fathoms on, 26 inches high and 18 inches wide. It took the breaking strain of 14 tons, and weighed 5 cwt. It is equal in strength to a 9 inch hawsen of tarred hemp, which would weigh to the same length 20 cwt., and occupy about ten One of these steel wire ropes is to be supplied to each vessel, and not only used for hawsers but for wheel ropes and other purposes.

> Among the things necessary in the improve ment of the Harbor of San Francisco and its approaches was the

REMOVAL OF NOONDAY ROCK.

This rock is in the open sea, about 3 nautical miles to the northward and westward from the North Farallone, and about 33 miles to the southward of west from Fort Point, in the open ocean. Directly over the rock at mean low water, there were 21 feet of water, although the water close around it, according to the United States Coast Survey, 18 from 20 to 30 fathoms deep. The rock was in the form of an irregular dome with steep sides. The evtreme dimensions at different depths below the plane of mean low water were, before the blast, as follows: 21 feet (the top), 5 feet 3 inches by 6 feet 3 inches; at 41 feet, 23 feet 8 inches by 17 feet 8 inches; at 47 feet, 26 feet 10 inches by 20 feet 8 inches. From this it will be seen that the contents above the depth of 41 feet were about 125 yards, and that the cubic contents above the depth of 47 feet were about 200 yards. Mr. Edward Moore, of Portland, Me., entered into contract to remove Noonday Rock to the clear depth of this was inserted a piece of much smaller of 48 feet for the sum of \$20,000. The rock appears to have been pinnacle formed. Mr. Moore came on from the East, bringing with him his own divers and foremen. Considerable delay was occasioned by a series of accidents to the machinery of the steamer Fidelter, which was employed in the work, and by the fact that three different times the buoys, rope and all, were stolen by coasters, necessitating delay in again finding the rock. About in fact, very much like the ordinary form of tating delay in again finding the rock. About blow-through oxy-hydrogen burner. A quan. tity of sulphur was placed in the retort, and the work was accomplished, most of them, howsufficient heat applied to raise the temperature ever, from Sir Francis Drake's Bay, where the to about 725° Fah., the point at which it vaporhered that the rock lay out in the open Pacific on a very windy and rough part of the coast. where there is always a heavy swell, the difficulty of the task will be understood. The con tractor at first intended to place his nitro-glycerine on the side of the rock, trusting to the weight of water for tamping. Noticing, however, that most of the large rocks on the coast have in them natural cavities and some times arches, he thought there might probably be one in Noonday. On examination the divers found a cavity at a depth of 50 feet from the surface, which exactly suited the purpose. As it was at such a depth below the surface, and followed with Fay's brake, and with respect to 17, such was the zeal and confidence of the in such an advantageous position, 800 instead this train we ought to say that the stoppage of 3000 pounds of nitro-glycerine were used, being fired by electricity from a boat about 600 feet distant, the steamer lying about half a mile The speed attained was 43.5 miles per hour, and In conversation with Mr. Moore, he stated to the writer that the sight was a most magnificent one. When the explosion occurred English steam and sailing vessels in the place of a solid body of water in the shape of a cone land Company then followed with a train fitted brought down from his glue factory in New large hemp hawsers. One was fitted on board | went up into the air about 600 feet, the spray H. M. S., Valorous, for a towing hawser. On and debris going up about 1000 feet. One very this ship one of these 4 inch steel wire hawsers, large piece of rock, apparently weighing about fected in 25 seconds, the distance traversed be- wheels and other appliances from the railway

could sue in the circuit court in their own names to prevent an infringement of their rights.

steel wire cable the Valorous has had in use fully removed, but unfortunately there are ever since she has been in commission, and many others in the same locality, some of which when recently brought up at Portsmouth she, are perhaps more dangerous then Noordey. are, perhaps, more dangerous than Noonday pensive to remove.

The English experiments upon

CONTINUOUS TRAIN BRAKES have begun, and the following, from one of our Sheffield (Eng.) exchanges, is the fullest report of the chief points of interest, so far as they have been made public. The important series of trials of railway brakes which is now being carried on under the immediate super ntendence of the Duke of Buckingham (presi dent of the Royal Commission on Railway Ac cidents), the Earl of Aberdeen, and other mem eers of the Commission, was resumed a few days ago. Previously the trials were confined o the various systems of continuous brakes he power being applied under sundry degree of pressure. Among the representatives of the various railway companies who were presen and took part in the proceedings we noticed Mr. Henry Oakley, general manager of the Great Northern Railway; Mr. Cockshott superintendent of the Great Northern Railway Drawling, locomotive department; Mr. Neele, superintendent of the London & Northwestern Railway ; Mr. Speight, representng the Midland Company (in the absence of shire; Mr. Stroudley, locomotive superintendent of the London & South Coast Railway; Mr. Brittan, locomotive superintendent of the Caledonian Railway; and Mr. Fletcher, Northeastern Railway, locomotive superintendent. The following is the official return of the results of the experiments, as supplied to our representative by the secretary of the Royal Commission

Continuation of Trial B, viz., tender brake, van break and a continuous break applied by

Company.	Brake.	Speed, miles per hour,	Distance train ran after break ap- plied.	Stopped in seconds.
Midland	Westinghouse.	54	1029	283
Ditto	Clarke.	58	1070	22
Ditto	Barker	50	1628	25

or cord signal and engine brake (if any), and tender brake and continuous brake applied by power is force multiplied by the velocity with driver and guard, and also engine brake (if any), which it is acting. "A word to the wise is cepting sand tubes:

Company.	Speed, miles per bour.	Destance train ran after break applied	Stopped in seconds.
Caledonian & South Coast		1603 1728	30
Lancashire and Yorkshire		1165	36 27%
Freat Northern		1143	30
London and Northwestern		1137	30
Midland (Westinghouse)		913	20%
Midland (Clarke)		1212	22
Midland (Barker)	50	1549	33

Stations

95 32 22 series E was continued: Tender brake and coneffected in 25 seconds in a distance of 365 yards. Next came the Caledonian train, fitted with Steele's air brake. Here a speed of 50 miles per hour was attained, the stoppage being ef-London, Brighton and South Coast train fol-lowed next, being fitted with the Westinghouse vacuum brake. Thirty-two seconds were occupied in stopping this train, the distance tra versed after applying the brakes being about give the correct time occupied in stopping. estimated at from 23 to 29 seconds. The Mid- They were willing, but incredulous. tained was 541/2 miles, and a stoppage was ef-

The Keeley Motor.

The following note to the Editor, from Port Henry, New York, was called out by a recent editorial:

"Permit me to suggest what you already know, that force, and heat, and power are substantially the same, or related to and causative of each other. Water under pressure gains force, heat and power. A word to the wise is sufficient."

The suggestion of our correspondent relates to what he supposes an oversight or omission in our comments on the Keeley motor. Let us see whether the suggestion is worth anything, or not: "Water under presare gains force, heat and power." True, it loes under pressure transmit force, gain heat and exert power, but the power it exerts is only equal to the power put into it in the applied pressure. If we lift it, it will fall, and in falling it will give out an amount of power equal to that required to lift it. That and no nore. If it exerts pressure upon air, the mount of compression and the amount of heat communicated to the air will be exactly measurable by the amount of power first ap plied to the water. By proper manipulation, the water can be made to exert a pressure almost infinite, but exerted through a space almost infinitely small. But pressure is Mr. Aliport); Mr. Fay, Lancashire and York-not power, in itself considered. To get power we must have pressure exerted through space, and the value of our power for mechanical purposes depends upon the distance through which it is exerted and the time occupied in traversing that distance. In other words, if we do not take into account distance and time, we can get immeasurable pressures from very moderate forces. This is only the old phenomenon of the lever or the steelyard, in which a pound weight will counterbalance a hundred pounds. But this is a problem in statics, which is the science of forces in equilibrium, or at rest, which must not be confused with dynamics, which is the science of force in motion. By the laws of statics Mr. Keely can get vast pressure from the difference in the levels of several columns of water; but by the laws of dynamics he can-not get any more horse-power out of one end of his machine than he puts in at the other. Con-Trials C and D conjointly, viz., tender brake sequently, to come back to our correspondent's and continuous brake applied by guards on flag suggestion, "water under pressure gains force," but it does not gain velocity, and using, in fact, all available means to stop ex- sufficient"-or ought to be, if our correspondent contemplates an investment in "cold vapor" motors.

Peter Cooper's First American Locomotive.

"On a recent trip down the bay of New York," says the editor of the Brooklyn Union, "we turned with the venerable Peter Cooper a page of the opening railway era of America. Mr. Cooper, he claims, deserves the honor, among the other honors of his useful life, of being the first to introduce into actual service the railway engine in America. We condens. from the very animated and interesting sketch of Mr. Cooper's reminiscences:

"Think of the excitement that pervaded the civilized world when it was settled that the Darlington Railway, which was opened to supply London with coal, had actually begun to carry passengers by steam at seven miles per hour. But we are able to correct the reminiscences of that occasion which shared the common mistake that the success of the Liverpool The following shows the method in which and Manchester Railway stimulated the introduction of railroads into this country, for some tinuous brake applied by driver and guards, of the now most important roads in this counand also engine brake (if any), using, in fact, try were projected and commenced before the all available means to stop, including sand Liverpool and Manchester was built. It re-boxes of engines and vans. The London and ceived with them the stimulus of the first road Northwestern train, fitted with Clarke & Webb's above named. In 1828 Mr. Cooper was in busibrake, was the first to start. A speed of 49.5 ness in New York, his native place. His miles per hour was attained, and although rain mother and grandmother were both born on was falling somewhat heavily a stoppage was the present site of St. Paul's Church, Vesey effected in 23 seconds in a distance of 326 yards. street and Broadway, and his mother remem-Proceeding to the next experiment, F, in which bered seeing the stockade still standing which the rear guard is to signal the driver by cord to had been erected to keep the Indians out of inapply his section of the continuous brake, or fant New Amsterdam. Mr. Cooper had bought the whole, the London and Northwestern train as a speculation the entire magnificent tract again came to the scratch. A speed of 54.5 in Baltimore now owned by the Canton Commiles per hour was attained, and a stoppage pany. Baltimore was then a city of 75,000 people, rich and prosperous, and had entered upon the railroad era. On July 4, 1828, the corner-stone of the Baltimore and Ohio Road was laid with imposing ceremonies by Charles fected in 22 seconds, the distance traversed Carroll, of Carrollton. It was pushed energetiafter applying the brakes being 326 yards. The cally, a little too much so, for when thirteen miles had been finished, it was found that in turning the rocks to save cutting, such short curves had been introduced that the then experts declared the line utterly useless. It could not be used by steam. Five per cent. 500 yards. The Lancashire and Yorkshire train had been paid in, and shares had been sold at people. But the chill was immense, and everywas most irregular, and it would be difficult to thing stopped. Mr. Cooper, then 38 years of age, saw new disaster to himself in the depreciation of his tract should the road fail. He the distance traversed after passing the signal proposed to the directors to construct an enwas 365 yards, the time occupied being variously gine that should be available on their line. with Clarke's hydraulic brake. The speed at- York an engine with three and a half inches cylinder and fourteen inches stroke, procured in the blace of her 1% chain cable, the former weighing 34 cwt. and the latter 12 tons. This ble obstruction to pavigation has been success—ments will be continued.

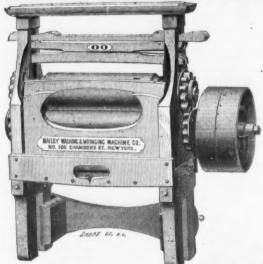
Weeden, of the corps of engineers, and a report own conclusions as to the comparative merits gine of 47 years ago with the ponderous made on the result of the blast. This formidable continued.

Of the different systems of brakes. The experiments will be continued.

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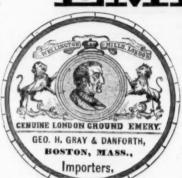
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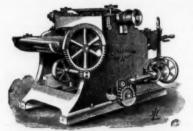
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cylinder is made of zinc or galvanized iron ?"

to use water from a water cooler in which the inside lining is either zinc or galvanized ed before the audience. A pair of planes in iron. It is true that there are people who contact, each weighing 3 lbs., were suspended do drink water from zinc-lined coolers, without in a vacuum which was shown to be nearly perfeeling any immediate effects from it. Still feet. To the bottom of the lower plane 12 lbs. zinc, in the form in which it is likely to be of lead was attached, giving a total weight of found in the water from a cooler, is decidedly 15 lbs. suspended from the upper plane simply and actively poisonous. When its results are not by molecular attraction arising from mechanifelt at once, we are by no means to conclude that | cal truth. The lecturer then explained to his they will not come at all; they may make their audience the construction of two measuring appearance after using a considerable quantity of the water. In our own case, we do not dare to drink from a zine-lined cooler, especially if while the other was equally effectual in ascerthe water has stood some little time, colic, pains in the stomach, and similar symptoms making their appearance within a short time, depending upon the quantity of water and the length of time which it has been standing. Some kine's of water do not affect zine, and in tration had been obtained. He pointed out the those one would suppose the water would be Unfortunately, the water formed by melting ice is extremely pure, almost equaling distilled water, and this is constantly diluting the water in the cooler. The water from rifling for heavy guns, and illustrated the rethe ice, of course, attacks the zinc readily and it sults of the system as applied to light artillery becomes unfit for use, because the purest water attacks the zine most rapidly. Although there are persons who do not feel the evil effects of drinking water containing zine dissolved in this way, yet we suppose that the majority of people are injured in one way or another, and we therefore do not think it safe to use water coolers in which zine comes in contact with the water. Our own experience and that of our friends is against it. In any event, we should advise that the coolers be thrown away when the least unpleasant feeling results from their use. The risk is too great, and what may be a small thing now, may become water attacks the zinc most rapidly. Although what may be a small thing now, may become serious as the use of the water is continued.

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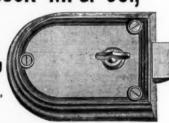
The Melting Points of Alloys of Tin and Lead.

	Constit	uents.	Point. hrenbeit	Consti	luents.	Point. Ibrenheit
1	Parts Tin.	Parts Lead.	Melting Po Degrees Fahr	Parts Tin.	Parts Lead.	Melting Po Degrees Fahr
	2	1	340	4	9	460
ш	9	4	344	1 4	12	482 494 502 513
.	10	4	348 352 356	4	15	494
١,	11	4	353	4	17	502
	12	4	356	4	20	513
	13	4	360	4	25	520
-	17	4	370	1 4	80	530
	22	4	880	4	38	540
	4	.55	360 370 880 390	4	48	520 530 540 550
	4	6	412	4	70	558
	4	7	420	Melt. po	int of Le	ad. 620

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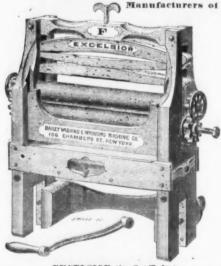
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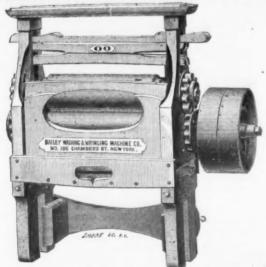
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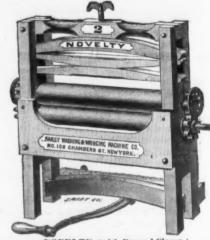




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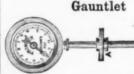
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placed one on the other and pressed by the

The Melting Points of Alloys of Tin and Lead.

oint.	uents.	Constituents.		uents.	Constit
Melting Po Degrees Fahi	Parts Lead.	Parts Tin.	Melting Point Degrees Fahren	Parts Lead.	Parts Tin.
460 482	9	4	340 344	1	2
494	12 15	4	348	4	10
502	17	4	352	4	11
502 512	20	4	356	4	12
520	25	4	356 360	4	13
530	30 28	4	370	4	17
540	28	4	880	4	22
550	48	4	390	5	4
558	70	4	413	6	4
sad. 620	int of Le	Melt. po	420	7	4

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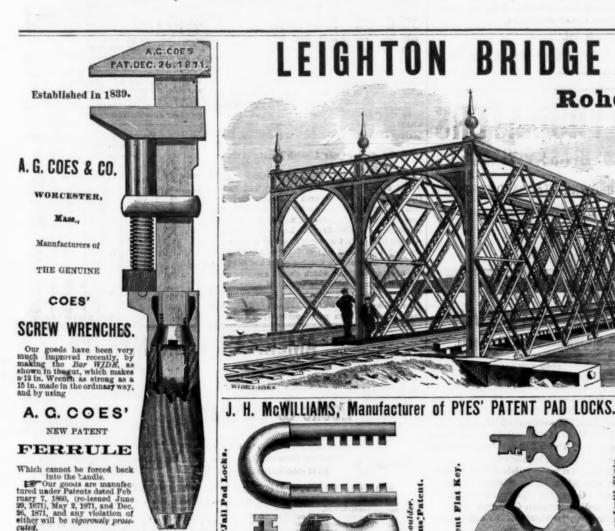
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Practical Tests of Fire Brick.

BY EDWARD J. HALL, JR., BLAST FURNACE

During the summer and autumn of 1874 the writer was employed by the Buffalo Fire Brick Works to conduct a series of practical experiments to determine what descriptions of firebrick were best suited to meet the requirements of the different classes of consumers; also, in general, to investigate such questions relating to the manufacture and use of refractory materials as were developed by experiment or inquiry. At the outset let it be fully understood that these experiments were made for their up over the grate, and then egg coal was laid private use only, and have no claim to scientific accuracy in determining degrees of heat, pressure and volume of blast, analytical composition of samples, etc. The object was simply to approximate, as closely as possible, to the conditions by which brick in actual use are tried, and to the fire, were placed side by side in the neck, by those means to determine which sample best the clamps, six in number, set in place, and met the necessary requirements in each case, everything plastered up tight, except the blast It is to be regretted that the subject could not have been treated with greater scientific accuracy, for its importance certainly demands it, but crude as the tests, to a certain extent, were, they involved months of labor and a large expenditure of money-the cost of apparatus, consuming from one and one-half to two hours. analyses, etc., requisite for great accuracy would have been too great for individual enterprise. A thorough investigation of the whole showed this to be rather a disadvantage, and a matter is well worthy of the attention of some scientific or trade association. The annual destructive heat. consumption of fire-brick in this country amounts to several million dollars, and in some departments of industry, notably in the steel size. The best Lehigh did not work so well as very large proportion in the expenses of manu- obstruct the biast than some softer kinds; on facturing. If the selection of materials and the other hand, Scranton was a little too light, all cases by the use to be made of the brick, re- other circumstances the results might have sults would be far more satisfactory. Take the been different, but it was found that unless the will always bake well, while those of another inevitably burn the bread. When we consider the conditions of trial in the varied uses, from the insignificant baker's oven to the blast or steel furnace, with all the changes of stock, fuel, cinder, fluxes, gas and heat, the wonder ceases that brick of a uniform composition should fail to meet the dem inds of every situa-

It may seem, at first, that the most useful statistics could be obtained by an investigation of different compositions of fire-brick in actual use, but, although I am indebted to a number of manufacturers for valuable information and assistance, especially in allowing the use of furnaces for practical tests, I found the condition so varied as to give no reliable comparative data. A still greater difficulty was found in securing fair trials and unprejudiced reports, subordinate employes, in many cases, throwing every possible obstacle in the way of obtaining information; this was especially so when they imagined that the result of the experiments would tend to economize labor. One amusing, although at the time rather annoying, report shows how little confidence can be placed in their investigations; two large specimen lots of brick, thousand each, were made of exactly the some ingredients and in exactly the same way, the only difference being that one qualities were best fitted for various situations, lot was stamped "No. 1" and the other "No. 5;" all were sent to the same iron works for a competitive trial; after some weeks the following report came in: "The No. 1 brick are excellent and we would like ten thousand more, but do not send us any more No. 5, they are good for nothing."

It is, moreover, perfectly easy, while giving a comparative trial every appearance of fairness, and presenting a perfectly truthful report, to so direct the investigation as to give any result dictated by carelessness, prejudice or 'dividends." Thus two furnaces may be constructed exactly alike, and may receive just the same treatment; yet one will always do better work and stand longer than the otherwhy no one knows; a furnace which has run for months may come down in a week after rebuilding owing to a change of stock, a new | in puddler, careless mason work, often for some heated furnace. To give each a fair trial it was apparently inexplicable cause. It soon became started at one end of the roof and moved forevident that it would require years, under the ward, one place at every heat, thus giving conmost favorable circumstances, to test any large stant rotation in the positions. The final test, number of samples in actual practice, and it as in the last case, was the number of heats became necessary to construct a furnace giv- endured. The standard brick stood 28 times, ing similar conditions of trial in a greatly intensified form. After a few experiments one was built with the following internal dimensions: Length, 3 feet; width, 18 inches; hight, 3 feet; the walls were solid and the top open. A few inches from the bottom ordinary iron grate hars made a fire place of the whole area: under this a blast pipe was inserted connecting the closed ash pit with a fan blower; clamps similar to those used on a puddling furnace were made to cover the open top; an exit for the gas was provided by extending one end of the furnace, just under the roof, into a neck or flue 18 inches long and 6 inches high; this result of bad burning. Brick liable to check communicated directly with the outside air, the dampers on the exterior.

In this last place the samples were

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value, for, up to a moderately intense heat, all The other cause of failure in brick made from fairly good brick would look about alike, and only the extreme which developed marked differences.

In all nearly 70 tests were made, the furnace each time containing seven or eight varieties of brick. The samples were sent by manufacturers and consumers, or purchased from dealers, efforts being made to secure specimens of every brand in the market.

MODE OF CONDUCTING AN EXPERIMENT. Each test occupied an entire day. The furnace was first cleaned and the necessary repairs made. Next a good bed of live coals was built on until the furnace was filled almost to the level of the top. On this the three brick tried each time in the fire were carefully laid and evened up so as to secure a uniform degree of heat. Then five brick, set on edge with ends

pipe and the open neck.

A very light blast was given until the coal was thoroughly ignited, and after that the fire was driven as much as it could be, until it was finally burned out, this last operation generally At first an attempt was made to renew the fire when it had burned down, but the result single fire always secured the most intense and

All varieties of fuel were tried, and the best found to be a moderately hard anthracite, egg trade, the cost of refractory materials forms a softer coals, being more apt to decrepitate and methods of manufacture could be governed in although it produced plenty of gas. Under oven; the heat is low and the manufacture of not sufficient. Connellsville coke did not do pecially well in bridge walls, steel furnaces, and a suitable lining would seem to be the easiest well, principally, I think, because the volume thing possible, yet brick of one composition of fuel was so small, and no kind of bituminous coal worked at all.

No observations were made of the blast, pressure and volume, but both were regulated so as to secure the most perfect combustion without waste of beat.

Since it was not possible to ascertain the exact number of degrees of heat reached in each test, another

STANDARD OF COMPARISON

had to be fixed, as it would evidently have been absurd to compare directly the results of one trial with those of another made under even slighly different conditions.

The method adopted was to take a brick known to be first-class, and in the end it proved to be the best, as a basis of comparison, and all tests were judged by that. As one or more of these brick was placed in each position in every one of the experiments, slight variations in severity did not affect conclusions. Samples were carefully arranged to give each an equal share of the heat, and as all were given as many trials as possible in each part of the furnace, at least approximate accuracy was attained.

THE RESULTS OF THESE TESTS

showed most clearly the defects and merits of the different brick examined; they showed what physical, and to some extent chemical, and how those qualities could be ascertained by a brief examination and simple test; they indicate not only how but also why brick fail in practice, and they point out a hitherto some what neglected field for investigation-a field which for thorough scientific tillage will return a bountiful harvest of practical informs

The results were so varied that it is necessary to look at them in detail, and, as the least important test, comes first-BRICK IN THE WALLS OF THE FURNACE. The action here was similar to that in any fire chamber; the final test was the stood best were those rather hard and dense in structure and containing an excess of silica.

conditions of trials resembled those met with were taken from the ends and center of each it is especially hard to locate the blame, be and the rest from that down to four (none of the evidently worthless brick were used in these covers). Brick in this position give out either from melting, checking or shrinking. Actual melting right down is due to poor stock, other things being equal; the other causes of failure may be remedied, but this is a fatal of the reports. For instance, one which stood defect; no change in proportions in the ingredients or skill in manufacture can make good brick out of poor clay.

Checking and dropping off come from improper mixtures of stock, usually from an excess of fine materials; they are sometimes the very low) would have given it a grade very are close-grained and dense, when broken across size of the opening being regulated by brick the fracture is smooth, one piece usually being Tests could be made, first, in the walls of the checkirg is due to bad burning, the "ring" is furnace; these were built in several vertical like that of a cracked earthen vessel. Such sections, each from a different manufactory; brick are of little use for roofs, clamps, &c., second, in the clamps which composed the for, although they may in some positions stand out a large hole and throws down a furnace,

effect is to open joints and allow the gas flame test was for

BRICK DIRECTLY ON THE COAL

This was the most severe trial as they were subjected to the action of fluxes in the fuel, as well as to direct beat. The best ones melted away and boiled considerably, and the poorest went entirely into einder, sometimes only leaving a trace of their existence in the shape of a glaze on better brick or the ashes below.

The severity of this test was determined by the appearance of the standard brick, and its grade recorded in numerals on a percentage system; then on this same system the general appearance of all the samples was entered: after this the brick were taken out and carefully broken for examination under the microscope; this determined the extent of melting. boiling or vitrifying, and the result was graded and recorded numerically; after this each piece was properly marked and boxed for preservacorrectness of any rating, renewed tests were always made.

from one-half to two-thirds. Some did much better, but more did worse. An English brick, which was sent as an unusually good article, could not be found at all except in a little glaze on a piece of cinder. This form of trial, alestablish exactly the absolute value of a brick. Those which stood the test here were found to all places where high temperatures were combined with the corrosive action of fuel or slag; but these brick might have, and in many cases did have, the for many uses fatal defects of shrinking and checking. To determine their value in these particulars was the object of the fourth test :

EXPOSURE TO A WHITE HEAT

in the neck of the furnace. Each time five brick were inserted, the standard brick always alternating with the others to make each determination correct and exact. Numerical reports were entered for the following points: 1st., general external appearance; this termined by the amount burned off, sharpness of the corners and extent of warping, or other distortion. 2d., checking; determined by the number, extent and direction of the cracks, reference being had to their injurious effects in actual use. 3d., shrinkage; all brick were curefully measured before going in and after coming out, but it took a large number of tests to give an accurate result, the difficulty so much as to render measurements uncertain with reference to shrinkage alone, but the subsequent examination under the microscope usually settled pretty definitely the amount of faith to be placed in the measurements. Some swelling instead of shrinking; this the microscope showed to be due to melting and boiling up, and a little longer continued heat would have run them entirely out of shape. An ordinary fire brick is 21/4 inches thick, and the shrinkage varied from less than one-sixteenth of an inch to over one-fourth. The grading was not made by deducting a certain number of hundredths for each sixteenth of an inch shrinkage, although that might at first seem fair, because a brick which would not shrink more than a sixteenth in that fire would be

or doing any work where solidity was essential. The fourth point was to determine the amount The second test was in the clamps. The of boiling, vitrifying or melting. Samples brick : the microscope, aided by measure inch in depth, but the larger part showed boilbarned into a light cinder; in all cases speci-

mens were preserved. When the experiments were completed the numerical value of each brick tested was determined by a comparison of the records, not by taking an average but by carefully weighing the conditions of each trial and the character especially well on the fire and for general appearance, checking and melting in the neck test, shrunk so badly as to be almost good for records (five marks being high and but one to nothing on the fire. These results did not out in what places they might be most advantageously used.

One class of brick does particularly well in roof; third, directly on the fire itself, and fourth, in the neck (this was the main trial, the others being to some extent in
a very intense heat without melting, a single but cannot stand a gas flame. Another goes to The structure is open and they are free from but cannot stand a gas flame. Another goes to The structure is open and they are free from for them. Thus the matter stood until July black spots due to sulphuret of iron in the last, when a letter from Mr Balley, containing clear heat. It is obvious that the first brick clay. The fracture, when examined under the but cannot stand a gas flame. Another goes to The structure is open and they are free from for them. Thus the matter stood until July ought to be used in a cupola, while the second microscope, should show a uniform mixture of mittee; and it was then decided that, when exposed to a most intense, cutting gas flame; The best brick burn off smoothly, so that all is precisely adapted for the roof of a heating so efficient was the action of this little furnace. The best brick burn off smoothly, so that all is precisely adapted for the roof of a heating give any indications of boiling or melting; if sidered in all its bearings, and that as much that of over 60 specimens of American and ing evenly over the surface, and any direct is sure to follow in both cases. Then the man-English brick, not one could resist its destruc- cutting action prevented. An end projecting, unacturer is blamed, and very justly, if the brick two heat. Just here let me say that unless the a hollow, a sharp angle or turn acts like a little were sold with a knowledge of their intended

not possible to determine their comparative nucleus around which center mighty forces. part of both manufacturers and consumers that heat without attrition. Brick having these good materials is shrinkage; this is due to in- ted to poor fire brick. In this, as in every is to be resisted; they are not so good for sufficient burning-indicated by a light color- other business, there must be some dishonest cupolas, blast furnaces, lime kilns, boiler setor to bad judgment in selecting, preparing or men, but on no higher grounds than business tings, &c., as brick designed especially for mixing stock, the mixture being ground too policy every reputable manufacturer must confine or else having too small a proportion of burnt clay, old ground brick or stone clay. The for the lowest living price—any other course various modifications intended to resist the acwould be the hight of folly-and the fact that to cut between the brick, which very soon destroys the best of them, or it may be so great could by any sort of courtesy be called first-wear of stock. Ordinarily these modifying as to cause a whole arch to collapse The third class, proves only that many dealers were unbuyer is equally positive that the fault is in the brick. Having already noticed some of the furnace, failure will be very unlikely to occur. ways in which trick give out from internal defects, it will now be useful to see the external contingencies which affect them, and the evidence obtainable in what may be called a "post mortem examination," to locate the blame.

When brick known to be good fail, the cause lies between the construction of the furnace, the stock worked in it, or the system of management. tion. Whenever there was any doubt as to the (No consideration is taken in this paper for accidents, as such failures are readily explained, and, in any case, would be beyond the limits As a rule, fairly good brick were burned off of the present discussion). The construction lines have a very great influence on durability; incorrect lines, which do not injure the quality or quantity of production, may rapidly destroy the furnace itself even when the faults appear very trivial; a root too low, a bridge wall too though good in its way, did not by any means high, a narrow or crooked flue, a sharp angle, -any one of a dozen such little defects is capable of giving a vast amount of trouble. I have apparently simple matter of brick for a baker's fuel was suitable for the furnace the heat was resist a very great heat in practice, and did escond the manufacture of not sufficient. Connellsville coke did not do pecially well in bridge walls, steel furnaces, and combustion chamber roof to make it last twice as long. Simply looking at a furnace will never detect this fault; measure the inside lines and sketch them on the original drawing; if bad designing caused the trouble this comparison will show the weak points. If the lines do not reveal the difficulty examine the work of construction. Very few masons really know

> HOW TO LAY FIRE BRICK WELL. Almost invariably they mix the mortar too stiff and use entirely too much of it, making joints as large as they would in a common red brick wall; corners will be found badly matched, the labor of cutting and fitting being replaced by a liberal supply of plaster. The most skillful plans and the best quality of brick count for nothing when joints are made half an inch thick. Fire mortar should be thin enough to run almost like water; the brick should be dipped in it and rubbed together, or else laid dry and the mortar poured on afterward, the great aim being to secure solid, even work ; all important joints should be carefully made with cut or matched brick, no holes being left to be being that so many brick melted and settled patched with bits of brick or clay. There is another point in this connection worth looking after: Boss masons often have their own ideas about correct shape and proportions, and with a total disregard of plans they jog on with cheerful unconcern in the old beaten track Failure, due either to faulty plans or bad workmanship, is apt to be local; a more general giving out follows from bad stock. A change of ore in a blast furnace may quickly cut it out some varieties being particularly hard on brick -that also may make the difference between a blast of six months or one of as many years. A cupola which usually lined up once a year changed its fuel and destroyed the same brick in three months; I remember another instance in which the same change in a rolling mill doubled the quantity of brick used. Sulphury stock is especially severe on ordinary fire brick, destroying them just as it does cast iron. An examination of practically about as good as one that did not shrink at all, while one that shrunk a quarter of expert whether the stock caused the trouble, number of heats stood; the samples which an inch would be worthless for turning an arch but consumers can judge better concerning this from their books.

In cases of FAILURE FROM BAD MANAGEMENT

showed very distinctly the approach of the most entirely from parties having a direct percause the evidence must necessarily come albrick to ultimate failure. The best specimens sonal interest in the result of their testimony; Mosquito classes of 720 and 360 indicated horsewere vitrified from a mere scale to one-half an no general rules can be laid down to meet these cases; usually only a thorough investigation by ing all through, some of the poorest being an expert will throw any clear light on the subject.

THE PROPER SELECTION OF FIRE-BRICK

little judgment; one extreme view sees no much greater first cost, greater weight, greater regardless of all fitness, finds perfection only nance and the necessity of having pure water in the most costly. A man would be considered insane who

resisting the cutting action of iron and cinder, distance when handled with moderate care, referred to, they should be invited to well burned they will not be very light colored or the outside, and will ring clearly but slighty obtained. The committee stated in paragraph when struck; too loud a ring is by no means twelve of their letter of the 7th August last as brick could be almost entirely destroyed, it was obstruction in a stream-slight in itself, it is the use. It is this constant mis-application on the desirable in brick designed to stand intense ollows:

causes one-half of the trouble and loss attribu- qualities are to be used where only intense heat those purposes, the most suitable brick for tion of melted iron, slag and fluxes, and the wear of stock. Ordinarily these modifying substances tend to lessen the cost, so that econable to procure good stock, which is by no omy as well as efficiency favors their use. The means plenty, or else lacked the requisite skill finest qualities of brick cannot be made for a and experience to properly mix and burn. But very small price, and in these grades cheap and even when the makers are honest and experi- poor are almost synonymous terms: it is due enced, and consumers take every precaution to to the same reasons which prevent iron made secure brick, not only of the best, but also of from "flue cinders" from being used for Besthe most suitable quality, disastrous failures semer steel. When informed of all the condiwill occasionally happen. The seller, knowing tions of use, manufacturers can often make the quality of his goods, feels convinced that great reductions in costs, as well as seeure there has been mismanagement, while the more efficient results. If, then, the brick are well laid, and used in a properly constructed

Physical Properties of Metals.

Metals.	Weight per cubic feet, lbs.	Specific gravity.	Tenacity per sq're inch, lbs.	Crushing force per sq. in., lbs.	Melting point, de- grees Fah.	Expansion bet. 32° and 313°.
Altuminum Antimony, cast	160 418	2°56 6°7	1,066		1800	·òòii
Bismuth	615	9.82	3,250		497	0014
Brass, cast	525	8.4	17,978	10,300	1890	
Brass, wire	531	8.2	49,000	20,000	2000	00.0
Copper, cast	555	8'89	19,072	11,700	2648	.0017
Copper, sheet		8.95	33,000			
Copper, wire	562	*9	61,000			
Gun metal		8.4	36,000			
Iron, bar	481	7-7	60,000	38,000	3980	*0012
Iron, wire			85,000		****	
Iron, cast		7.18	19,000	92,000	2741	.0011
Lead, cast		11.32	1,824	7,000	630	0028
Lead, sheet			3,398			
Mercury	847	13.56	44 000	****	39	'016
Silver	654	10.47	41,000		1873	0019
Steel	487	7.8	120,000	18 000	2500	
Tin		.7	5,000			10021
Zinc	404	- 1	8,000		740	.005

Numbers and Weight of Sheet Zinc.

Thickness.			Weight in Pounds.			
No.	I	ches.	Sq'are Foot.	Sheet. 36x84 inch		
1	(0.0039	0.1413	2.98		
5	(0.0113	0.4117	8.64		
6	(0.0133	0.4792	11.06		
7		0.0150	0.5468	11.48		
8	(0.0169	0.6144	12.90		
9		0.0187	0.6850	19:32		
10		0.0224	0.8172	17.16		
11		0.0261	0.9524	20.00		
12		0.0298	1.0875	92.84		
13	(0.0336	1.2227	25.68		
14		0.0373	1.3579	28.52		
15	1	0.0410	1.4930	31.36		
16		0.0447	1.6282	34.19		
17		0.0521	1.8998	39.87		
18	. 1	0.0596	2.1689	45.55		
19	(0.0670	2.4393	51.23		
20		0.0744	2.7096	56:90		
21		0.0818	2*9800	62.28		
22		0.0892	3.2503	68.2		
23		0.0966	3.5207	73.9		
24		0.1040	3.7910	79.6		
25		0.0114	4.0614	85.21		
26		0.1189	4.3817	90.97		

Perkins' Boilers.

We take the following interesting article from The Engineer :

We stated recently that one of Mr. Perkins' nigh pressure engines and boilers was about to e fitted to one of her Majesty's ships. The following is a copy of the report of the Committee on Boilers appointed by the Admiralty, dated the 19th day of September, 1874, on the propriety of constructing engines and boilers on Mr. Perkins' plan for marine purposes, which has resulted in the order above referred to being given. The Committee on Boilers state, for the information of the Lords Commissioners of the Admiralty, that they have carefully and fully considered the propriety, or otherwise, of constructing engines and boilers on Mr. Perkins' plan for marine purposes. From official papers which have been placed before the committee, it is found that in March, 1873, the Yorkshire Engine Company were called upon to forward tenders for engines on power respectively. In May, 1873, tenders were forwarded accordingly, and after a careful examination of the designs as submitted by the Yorkshire Engine Company, the engineer-inchief of the navy considered the disadvantages for any given purpose is a work requiring no connected with the engines on this plan were my beyond a saving in first cost; another, complexity of engines, greater cost of maintein bollers. The matter then remained in abeyance for some months, but in May last attenwould select for cheapness a broken down tion was again called to this subject, and it cart horse to ride on a journey requiring the appeared from the Yorkshire Engine Company's greatest speed and endurance, and no less so, letter, that they had in in their former tender nothing for general use; still an average of all if, needing a dray horse, he bought the most for engines misunderstood the power to be costly racer and expected to have the best be- given; and consequently had prepared and forcause it was the highest priced; but a good warded a design for engines of a greater maximuch above its merits; other brick which stood many clever people, who could by no means be mum power than was required. The company up and looked well in the neck burned away deceived in a horse trade, adopt plans like these shortly afterward forwarded a revised tender in making the most extensive purchases, with- and drawings for engines of 720 indicated very concave, and the other convex; when prove them to be worthless, but rather pointed out a thought of the absurdity. The best horse-power for a vessel of the Fantome class, quality of brick for standing intense heat are in which the space, weight and price were renever very strong and tenacious, although duced. It was then decided that when it bethey should stand transportation for a long came necessary to obtain engines of the power black spots due to sulphuret of iron in the last, when a letter from Mr Bailey, containing

"The committee have also had under their careful consideration the plan of engines and boilers on the system proposed by Mr. Perkins, and have inspected the engines on this plan, which are on board the Emily, a small yacht while under weigh; and the Filga, a tug, as well as the engines which are now at work in his factory. The committee have examined Mr. Perkins, and have applied to him for more specific information relating thereto; and on receiving Mr. Perkins' reply a further commu-

nication will be made on the subject.' Since that date the committee, with a view to a more searching investigation of the condition of the boiler and cylinders of the land engine at Mr. Perkins' works, induced him to open out the boiler, and cut open three of the tubes from different levels; and also to open out the cylinders, and have the pistons drawn. This was done in the presence of the committee, and a strict examination was made of all the working surfaces and the state of the tubes, and samples of the tubes, &c., were obtained. The tubes in this boiler had been in use, it was alleged, nearly thirteen years; and they were found to be in a remarkable state of preservation; and the piston, pucking and valve rings of the engine, which were of Perkins' patent metal, composed of five parts of tin and six teen parts of copper, and which were stated to have been in place and at work without lubrication eighteen months since last examined, were found to be in a similar condition. Bearing in mind that the main feature involved in Mr. Perkins' system is the use of soft fresh water, or rain water, over and over again, the waste being supplied by water obtained from a double-distilling apparatus, the committee have directed their attention to some other engines using fresh water, with a view to obtaining as much information as possible on the point referred to. They have accordingly obtained evidence in regard to the following engines and boilers with which fresh water is used, observing that it is the general practice to have fresh water in land boilers, viz.; (1) A land engine at Messrs. Gwynne's works, Essex street, Strand; (2) a land engine at the works of Messrs. J. Stewart & Co., Isle of Dogs, Blackwall; (3) a land engine at Messrs. Merryweather's, Lambeth; (4) the fire engine boliers at Messrs. Merry weather's and at Messrs. Shand, Mason & Co.'s; (5) the boilers used for producing steam for warming the Houses of Parliament; (6) and also cases in which attempts have been made to use fresh water at sea in marine boilers. The committee visited these different establishments, and, so far as they could, have examined the boilers and obtained on the spot as much information as possible. Although it does not appear that any of the systems at present in use are worked exactly on the same principle as Mr. Perkins adopts, yet the committee are of opinion that there is an advantage in using soft fresh water in boilers generally; and the favorable opinion which they have formed with regard to the Perkins' system has thus been so far confirmed. The committee, then, are of opinion that evidence sufficiently satisfactory has been obtained of the working of Perkins' system to enable them to propose to their lordships that experiments should be made on such a scale as to test its value, with as little loss of time as possible; and they therefore recommend, with the view to thoroughly testing the system in a practical manner, the under-mentioned engines, &c., should be obtained, viz. : (1) A land engine and boiler for use in one of her majesty's dockyards; (2) a pair of marine engines and bo'lers for use in one of the harbor vessels, such as one of the home port tugs; (3) a set of engines and bollers for a small sea-going man-of-war, as proposed by Mr. Wright, engineer-in-chief of the navy : (4) also that some vessel at present fitted with compound engines, and about to receive new boilers of ordinary type, should be fitted with a surface condenser on Perkins' principle, in order to test its applicability to that description of boiler. In all these trials the system, as pursued by Mr. Perkins in his land engine. which the committee have examined, should be most closely adhered to; and his metal applied wherever requisite to avoid the necessity of internal lubrication, which, it is alleged, is not required when that metal is used. In consideration of the circumstances in which Mr. Perkins | prize to be shot for at the rifle match between is placed with regard to the Yorkshire Engine Company (Limited); and as the committee are not aware that this company have hitherto supplied marine engines or boilers for her majesty's service or the merchant service; and looking to the general circumstances attending the application of a new invention to engines of a larger size, and of different construction to those which have hitherto been tried under Perkins' system, the committee would suggest the propriety of constructing these engines and boilers in one of her majesty's dockyards, under the superintendence of Mr. Perkins, if their lordships should under the above-named circumstances deem it desirable so to do. In the event of their lordships arriving at this decision, the committee would suggest that the drawings for the engines, boilers and condensers should be prepared by Mr. Perkins, and sub-mitted to the Admiralty for approval; and that for this purpose Mr. Perkins might have the assistance of a draughtsman, but he should take the whole responsibility of the result, and superintend the construction in the ordinary manner as an engineer. It is the intention of the committee to keep the question of the use of soft fresh water in view; and they expect to obtain still further evidence during their visits to the different seaports and manufacturing towns of the country; yet they have considered it advisable that they should at this time state their views upon this question, so far as they are enabled to do so, reserving their detailed and more matured opinions on the question of

Weight of Cast Iron Pipes of Different Thicknesses.

Diameter.	Thickness.	Weight.	Diameter.	Thickness.	Weight.	Diameter.	Thickness.	Weight.
Ins.	36	Lbs. 12.28	ins, 434 436		Lbs. 36.73	Ins.	Ins.	Lbs. 43.68
	% %	17:15 22:15	41/6	36 %	24:49 31:4		% %	58·8 63·18
834	34 36	27.56 18.4	4%	% %	38 58 25 7	7	XXXXX	36.66 46.8
	56 34	23.78		% %	39.91 40.48			56 96 67 6
31/6	X	19.66 25.27	5	X6	26 94 31 34	736	NI XXXXI XXX	78 · 39
8%	% %	81.2	536	% %	42:28		% %	49:99 60:48
	1/4	26 · 83 83 · 07	1	56 82	89°44 45°94		%	71 76
4	X	28.28	6	8	81 '82 40 56	8	36	41 · 64 52 · 68
436	MANAMANAMANAMAN	84 · 94 28 · 85		MAKE MAKE MAKE MAKE MAKE MAKE MAKE MAKE	49.6 58.96		34	64 27 76 12
-/-	5%	29.85	6%	36	34.32		1°	88.2

Art Works in Silver.

Messrs. Tiffany & Co., of Union Square, have actly finished several pieces of silver plate de signed as prizes for competition at the several regattas which are to take place during the present summer, and for other objects, which reflect great credit on their inventive skill as art workers in silver. The most imposing objects in the collection are two vases or cups ordered by the Grand Union Hotel, of Saratoga, to be awarded as first and second prizes to the victorious crews at the coming college regattas at Saratoga in July.

The first prize is a silver cup standing upon an ebony base. The silver design, exclusive of the base, is 38 inches in hight by 16 inches in diameter in its widest part. The general finish of the bowl is plain, but at the outer circumference it is encircled by an ornamental band, bearing at intervals, in high relief, the heads of river gods, and these are divided or separated by crossed rudders, on each of which is inscribed the name of some American river upon which rowing is done. Back of the rudders, and also in relief, are the aquatic plants known familiarly as cat's tails, which give a graceful finish to the interlocked design. In lieu of handles, the sides of the cup bear crossed oars bound with wreaths of laurel in open work and high relief. The top of the cup is surmounted by an exquisitely wrought figure of an oarsman in rowing costume and standing erect, his right hand resting upon an inverted oar, and the left hand holding a laurel crown and supported by a rudder inscribed with the word victory. The central band around the cup and the objects in relief are delicately tinted with gold, which adds greatly to the general richness of the design.

The second prize is smaller in size, but entirely original in design and very elegant. It is in the form of a cup with a burnished bowl. Its front is ornamented with crossed oars and sprigs of laurel in high relief; and the whole is crowned with the figure of a sailor boy holding aloft a laurel crown in his right hand. while a rudder supports the left hand. The figures in relief are all tinted with gold and grand prize.

Messrs. Tiffany & Co. lately made a large and elegant cup, ordered by the American team of sharpshooters engaged in the Creedmoon contest last year, and designed for presen-tation to the Irish team. The cup is of burnished silver, and has upon its front an elaborate design, with a shield in its center We have Removed our office and stock of Cutlery to bearing an eagle, and relieved by crossed guns, with telescopic guide-sights, representing the Sharp and Remington rifles, interwoven, with which are sprigs of the laurel and shamrock At the butts of the guns is a ribbon, which binds the two together. The side figures which serve as handles are very elaborate. wrought in the form of winged females with outstretched arms bearing laurel crowns, and represent victory. The neck of the bowl is inscribed with the motto, "E Pluribus Unus and the whole is surmounted by a statue after Crawford's figure of "America," which crowns the dome of the Capitol at Washington. figures and work in relief are all gold tinted.

To accompany this elegant international gift Ireland and the United States this summer, and afterward to be shot for by the members of the

afterward to be shot for by the members of the winning team. It weighs one hundred and twenty penuyweights, and has upon its face a shield, in blue and red, surmounted by a horse shoe in platinum, set with diamonds to represent the fastenings. The whole is surrounded by a laurel wreath and surmounted by a horse's head. The reverse bears a suitable inscription.

The prize to be contended for this summer by the New York Yacht Club is one of the most valuable ever offered for that purpose in this country, and, as a further merit, it combines utility with beauty. It is in the form of a dinner service, and consists of a soup tureen, a chowder bowl, a center piece for fruit, and a pitcher. The center piece for fruit is of circular form, with flaring handles and pendant ornaments. There is a dolphin at the base, and fish and seaweed are wrought in relief upon the bowl. The soup tureen is oblong, and its style of ornamentation corresponds with that of the fruit piece, except at the top, where it is adorned with a walrus, corresponds with that of the fruit piece, except at the top, where it is adorned with a walrus, which is hand-wrought, and a very artistic, as well as original, piece of work. The chowder bowl has upon its cover a bold design in the form of a foul anchor in oxidized silver, and its sides are ornamented with crossed sculls. The pitcher is of very massive design, and is decorated in repousse, with mythological compositions. sitions.

Special Notices.

MANUFACTURERS

desirous of introducing their goods to the **British** and **Continental** Markets, are advised to insert advertisements in the newspaper "IRON," produced in the newspaper "IRON," lished every Saturday, at 99 Cannon Street, London, E. C.

and more matured opinions on the question of the use of soft fresh water for marine boilers generally, until their final report.

SCALE: First 3 lines, 3/; every additional line, 10d. Price, 6d. per Copy, or 30/ per annum, inclusive of postage to the United States.

Special Notices.

THE SIXTH Cincinnati Industrial Exposition

GRAND 16 DEPARTMENTS

Machinery Tested and Fully Reported upon.

Send for rules and premium list, and blank applications for space. FRANK MILLWARD, Sec'y.

TENTH Industrial Exhibition

Mechanics' Institute.

Of SAN FRANCISCO.

Manufacturers, Mechanics, and others, are advised that the above Exhibition will be opened in

17th day of August

next, and will continue open at least one month.

The Board of Managers invite all who desire to exhibit, to send in their application for space without delay to Mr. J. H. CULVER, Secretary, 27 Post St., San Francisco, who will promptly answer all inquiries.

700,000 PERSONS

from all parts of the Pacific visited the Exhibition of 1874, to see what could be learned or purchased in San Francisco, with inited States.

San Francisco, with inited States.

San Francisco, with inite polation of one quarter of one million, is in initimate relations with Japan, Chins, Australia, Mexico, Hawaian Islands, British Columbia, the various islands of the Pacific and contiguous domestic territory.

There is no charge of exhibiting, and power for driving machinery, etc., is furnished free.

By order of the Board of Managers.

A. S. HALLIDIE, Prest.

Briesen's Patent Agency FOR SECURING INVENTIONS, TRADE

MARKS, &c., IN AMERICA AND LUROPE.

No. 258 Broadway, New York. A. V. BRIESEN.

TO LET.

correspond in richness with those upon the A Light, Handsome Office

Possession Immediately. HERMANN BOKER & CO., 101 Duane Street, N. Y.

REMOVAL.

107 Duane St. PETERS BROTHERS.

WANTED.—A first-class business man familiar with machinery and manufacturing, capable of handling large bodies of men, desires a responsible position. References satisfactory. Address, IRON AND STEEL,

Care of P. O. Box 813, Bridgeport, Conn

DROP FORGINGS.

The TRENTON VISE & TOOL WORKS, Trenton N. J., having increased their facilities, are now able to do all kinds of

Iron and Steel Drop Forgings in quantities to order at reasonable rates

HERMANN BOKER & CO, Proprietor 101 & 103 Dunne St., N. Y.

McHaffie Direct Steel Castings Co.

STEEL CASTINGS,
Solid and Homogeneous, guaranteed to stand a Tensile
Strain of 25 tons per square inch. An invaluable substitute for expensive WROUGHT IRON FORGINGS or for Iron Castings, where great strength is required. Office, or the strain of th

Merchant Iron or Nails

Wanted in exchange for 300 tons No. 1 Wrought

GILCHRIST & GRIFFITH,

Mount Pleasant, Iowa

A. PURVES & SON, Corner South & Penn Streets, Phila., Dealers in

Scrap Iron & Metals, Machinery, Tools, Shafting & Pulleys, Steam Engines, Pumps & Hoilers, Copper, Brass, Tin, Babbit Metals, Foundry Facings. Best Quality Ingot Brass.

for Sill &c.

For Sale,

Several Second-Hand Railroad Locomotives, 4 ft. 81 in. Gauge.

Address, Box 885, Pittsburgh, Pa.

Special Notices.

Round Mountain Furnace Iron Ore & Mineral Lands, For Rent.

The above named property, located on one River. in Cherokee county, Ala., half mile from : amboat landing, is offered for rent for two years, payable in Pig Iron. The furnace is 45 feet high, 8 feet and 8 inches bosh, and is provided with pipes for warm a month capacity; fine manager's house, large store, blast. During last blast she made 11% gross tons stables and workmen's houses, &c. Labor 75c. a Opens for the reception of goods August 2, per day first-class car wheel iron. The ore—red oxide, forlifferons—averages 58 per ceut., and can and continues open until October 9th. stone \$1.50 per ton, and charcoal at 6% cents per It requires about 7 per cent. hm

Address E. A. WILLIAMS, Prest. Rome, Ga

M. DWINELL, R. P. SIBLEY, H. YANGEY.

TO INVENTORS AND MANUFACTURERS

Important to Manufacturers. BISSELL, WELLES & MILLET,
Auctioneers and Commission Merchants, No.
15 Murray St., New York,

15 Murray St., New York.
Solicit from Manufacturers and others consignments of Hardware and Cuttery for our weekly Auction Sales to the Trade, or at private sale for cash, as desired. Our facilities for moving large lines of goods are unsurpassed. Advances misde if desired.

An experienced Traveling Salesman in Hardware and Cutlery, intimately acquainted with the jobbing and retail houses throughout the Southern States in above lines, is open for engagement.

Address HARDWARE, Box K. Office of The Iron Age, 10 Warren St., N. Y.

Furnace Engineering,

Plans, Estimates and Superintendence FOR BUILDING OR REPAIRING.

Reliable Analyses Furnished, and Advice given concerning the Value of Materials, Best Mixtures & Methods of Working. Special Attention paid to Investigating Cases of Unsatisfactory Results.

Furnace companies supplied with first-class men for all positions. Competent managers and founder desiring situations are requested to send full particu-lars. Correspondence solicited on all topics of in-terest in furnace work. Letters answered promptly without charge. Address,

EDWARD J. HALL, Jr., Blast Furnace Engineer 452 Franklin Street, BUFFALO, N. Y.

Roller Wanted. One accustomed to rolling Skelp and

Band Iron.

The above can have a good and permanent job by applying to the undersigned without delay. One that can turn rolls would be preferred.

J. H. JAUUNS,

521 Court Street, Reading, Pa.

HARDWARE.

FOR SALE in the best business part of Jersey City, a first-class Tool and Hardware business. Established about 25 years, and doing a fair business.

Apply to H. LUTTGEN.

57 Montgomery St., Jersey City.

SITUATION WANTED. By a German, who is a thorough practical ENGINEER and MACHINIST of twenty-three years' experience, fifteen of which he carried on a machine shop, having all the latest improved machinery, such as Steam Hammer, Boring and Planing Machines, Lathes, Boit Works, &c.

He has full knowledge of fixing, driving and repairing Steam Engines and Boilers, &c.; also, is well acquainted in Iron and Steel Rolling Mills. He is thirty-eight years of age.

For further particulars apply to

J. E. SCHNEIDER, Augusta, Ga.

For Sale.

For Sale,

Car Shop in Conshohocken, Pa., 50x100 ft. fronting on P. and R. B. R., with blacksmith shop 20x30 ft., engine house 15x30, 25 horse engine, and all the modern machinery necessary. The lot is 135x300 ft.

Best German and Belgian Brands, By LOUIS WINDMULLER & ROELKER, 20 Reade Street, N. Y.

HUTCHINSON & FAGAN. Norristown, Pa.

INDIANAPOLIS.

The Best Retail Hardware Stand

in the State of Indiana For Sale, FOR 30 DAYS ONLY. \$30,000 capital required. Sales now running from \$400 to \$600 per day. The very best reasons given for wanting to sell, which have no rela-tion with the business. Such an opportunity for safe and profitable investment is rarely ever offered. R, S. DORSEY, Broker,

8 Bates Block.

SPECIAL NOTICE.

I have three patents for Dies, Machinery, and Tools for making Augers and Bits, each running seventeen years; dated as follows: Dec. 19, 1865; January 31, 1866, and July 3, 1866. There is a special cleim on each of the Dies. All persons infringing on said patents will be held responsible to the extent of the law. Russell Jennings.

DEEF RIVER, Conn., Sept. 7, 1874.

DISCOUNT LISTS. Iron Screws, Revised Lists, 13 Discouts, 75c. each. Files & Bolts, {Bolts, Revised and Old Lists.} \$1 each

Address, with cash, Dayton & Lamberson, 77 Chambers St., N. Y.

Charcoal Blast Furnaces. Having during the past 10 years constructed and put in operation a number of the most successful Charcoal Blast Furances in the country, and having a competent corps of workman constantly in my employ, I am enabled to offer advantages in constructing or remodeling upon the latest and most approved plans.

Examinations of Furance Property made and reported upon when solicited. Correspondence promptly attended to.

J. M. WHITE, Engineer, 22 W. Alexander St., Rochester, N. Y.

for Sale, &c.

Thirty thousand acres, abounding in the several varieties of Hemstite and Magnetic ores, covered with timber; limestone abundant; contiguous to one of the largest Railroads leading east and west, low freights insured; coal within 20 miles of Works. Consists of Charcoal Furnace and Forge of 200 tons day; cost of Charcoal, 5c. a bushel; iron ore, \$1.75 a ton; lime stone, 80c., all delivered at Furnace. Freight to Pittsburgh, \$3.50, Baltimore, \$2.40. Ores can be placed in Pittsburgh almost beyond competi-tion. For sale, or will be operated jointly.

Address, P. O. Box 863, Baltimore, Md.

For Sale! Hardware Business

In a growing manufacturing town, one of the best locations in Vermont. Business well established and profitable. Stock about \$10,000, in good order, This affords an excellent opportunity for a party with small capital to secure a paying business.

Address, W. R. BIX BY & SON, Vergennes, Vt.

For Sale.

A first-class Hardware Business, located in the thriving city of Bloomington. Ills. Above business has been established for over twenty (20) years, and presents to any one desirous of doing an 'A No. 1" retail and jobbing trade a most favorable opportunity. Amount of stock about \$15,000. Will be sold at a sacrifice. Ample rea-ons given for selling. For further information, address. urther information, address, GEO. BHADNER, Bloomington, Ills.

FOR SALE.

An % inch mill train for making Merchant, Band

and op Iron. Will be sold cheap. W. W. JONES, Apply to

Near the Lehigh Valley Railroad Depot,

Allentown, Pa.

FOUNDRY PROPERTY FOR SALE,

Or to lease with privilege to buy: consisting of Foundry, Machine Shop, with powerful steam engines, and other buildings. Water front on North River, Peekskill, 42 miles from New York, comprising 21/4 acres. Apply for particulars to Box 339, P. O., Peekskill, N. Y.

To Stove Manufacturers and Foundrymen.

The Carbon Stove Company, Of Burlington, N. J.,

Will sell their Foundry, with all its appurtenances, business and good will, upon very liberal and accom-modating terms, offering to any party wishing to en-gage in the Stove or general Foundry Business a

are opportunity.

The Foundry Buildings, which are of a capacity to employ forty or more molders, are very conveniently located upon navigable tide water on one side, and the Pennsylvania Railroad, with its freight station in front, being on the direct line between New York and Philadelphia.

The Buildings, Machinery and Appliances are all in prime order, and the assortment of Patterns, &c., for Stove, Range or Heater work, unsurpassed.

Address, for terms or other particulars, CARBON STOVE CO., Burlington, N. J.

For Sale, Hardware Business

n successful operation since 1845. Rare opportunity to ceure an old and established business. Stock of General Hardware, Iron, Nails, &c. &. will invoice \$6000 of \$6000. Two story brick business room, 25x90, with cliar under all, for \$3000. After first payment will take such terms as will be easy, and cannot fail to suit urchaset. Will assist burchasier at starting, for necesary. Satisfactory reasons for selling will be given.

Address,

Cambridge City, Wayne Ce., Ind.

BLAST FURNACE FOR SALE at Nananoch, Ulster Co., State of New York, on A Napanoch, Ulster Co., State of New York, on the Delaware and Hudson Canal, with extra facilities, and a canacity of 20 tons per day Anthracite or i5 tons of Charcoal, together with a splendid water-power, goes with the furnace of the furnace is in good order and could be put in blast in a short time. Will be sold very low on accommodating terms. Charcoal can be had for many years.

Address, H. BANGE,

94 Gold Street, New York City.

FOR SALE. At Lowest Manufacturers' Rates.

GUNS & SHEET ZINC.

For Sale, Stove and Tin Business.

Will sell, on cood terms, one of the best arranged House Furnishing Stores in Canada West, at St. Thomas. The premises are roomy, the buildings having been arranged especially for this trade, with Tinsmith's workshops and benches complete for 19 men.

Present Stock about \$6000.

St. Thomas is the head quarters of the Canadian Southern Railway Co. To a practical, energetic man this offers unusual advantages. Business well established and with good connection. Reason for disposal, present proprietors increasing their whole-sale and retail Hardware Store next door to the above premises. Address

HORSMAN & HORSMAN, Iron and Hardware Merchants, St. Thomas, Canada West.

Paci Erie Ohio Unio Miss C. C. Han

It men Transcript ity s prepring much trad doing



FOR SALE,

at 10c. a copy, general Spanish
Weekly Market Review, wilten and published by the subscriber.

Is a nally 1875, number 197, creuten and published by the subscriber.

Sally, 1875, number 197, creutental and South America, including Brazil, Spain
and Manila, on which certain standard articles of
American manufacture are quoted. Specimen Copies
sent free. The uncersigned is also

Translator for Manufacturers and

Translator for Manufacturers and Land Companies, from and into the

ENGLISH, SPANISH, FRENCH,

and GERMAN. Spanish Catalogues got up correctly and with desatch. Address. C. KIRCHHOFF, Metal Reporter of " The Iron Age, Box 3091, N. V.

Trade Report.

Office of The Iron Agk Wednesday Evening, July 7, 1875. During the past week the financial markets have lacked activity, and there is but little of general interest to note. The glut of money continues in the loan market, and borrowers on call are freely accommodated, on pledge of good security, at 1½ @ 3 per cent. The July disbursements will probably add largely to the dating capital of Wall street, the amount becontinues in the loan market, and borrowers on Ing estimated to exceed \$50,000,000. Commercial paper is not in great request, nor is much

Sole importers Birmingham Screw Co.'s Screw George W. Bruce informs us that he has i The discount rates are fairly quoted at 31/4 @ 5 per cent.

The gold market has been free from speculative excitement, and the transactions of the gold room have been small. The following table shows the daily range of the as low a figure as any first-class America. premium:

*	Highest.	Lowest.
Thursday	11736	116%
Friday	117%	117
Saturday	1175	117
Monday		***
Tuesday		117
Wednesday	117%	116%

The stock market has been fairly active for railway and miscellaneous shares. The general improvement which began last week continued until the announcement of the failure of the Lake Shore Company to pay interest was made public, when the market broke, recovering again somewhat toward the close of the week. The principal dealings have been in Lake Shore, Pacific Mail, Erie, Western Union, Northwest, St. Paul and Union Pacific. We give below the highest and lowest of to-day's quotations of active shares.

The bond market active and firm, with a

The bank averages for the past two weeks compare as follows:

	June 26.	July 3.	Difference.
Loans	\$276,707,800	\$279,397,200	Inc. \$2,689,400
Specie		13,824,600	Inc. 4,977,600
Leg. tend		72,832,100	Inc. 2,340,600
Deposits	235,768,000	245,896,700	Inc. 10,128,700
Circulation.	19,016,500	18,982,500	Dec. 34,000
The follo	wing table	s show the	foreign trade
ma a mannam ta	of the mee	le •	

IMPORTS. 1873. 1874. 1875. Total for week.. \$4,112,009 \$5,107,430 \$6,368,188 Prev. reported... \$13,103,606 \$11,153,581 175,747,333 Since Jan. 1.....\$917,215,615 \$216,261,011 \$182,115,521 Among the imports of general merchandise

were articles valued as follows:

	Quant.	Value.
Brass goods	5	\$395
Bronzes		1,647
Copper		4,682
Cutlery		11,918
Guns	82	5,137
Hardware		4,502
Iron, pig, tons		11,378
Iron, sheet, tons		1,014
Railroad bars		66,455
Iron, cotton ties		1,514
Iron tubes	231	371
Iron, other, tons	211	12,054
Iron ore, tons		9,396
Lead, pigs		26,659
Metal goods		15,744
Nails		547
Needles		4,137
Old metal		2,160
Platina		8,005
Per. caps		1,659
Saddlery		1,832
Steel		15,525
Silverware		401
Tin, boxes		148,693
Tin, 218 slabs	22,610	4,291
Wire	221	4,189
Wine	119 750	7 660

Zinc EXPORTS, EXCLUS	IVE OF SPECIE	7,669
1873. For the week \$4,964,510 Prev. reported140,309,601	1874. \$7,387,186 144,980,677	1875. \$6,190,155 121,751,996
Since Jan. 1 \$145,174,111 EXPORTS OF		127,942,151
Total for the week Previously reported		
Total since January 1, 1875.		. \$53,944,686

Same time in 1873	
at the following quotations:	
Bid.	Asked
U. S. Currency 6's	1223
U. S. 6s 1881, reg 120%	1213
U. S. 6e. 1881, cou	-
U. S. 5-20 1862, cou	weeke
U. S. 5-20 1864, reg	_
U. S. 5-20 1864, con	_
U. S. 5-20 1865, reg12034	
U. S. 5-20 1865, cou	1223
U. S. 5-20 1865, reg. new 1201/6	1203
U. S. 5-20 1865, cou	1209
U. S. 5-20 1867, reg	
U. S. 5-90 1867, con	1223
U. S. 5-20 1868, reg	
U. 9, 5-20 1868, cou	122
U. S. 10-40 reg	118

The following were the highest and lowest

THE TORONTON HOLD THE INDICES AND	W W
prices of stocks to-day:	
Highest,	Lowest
N. Y. Cen. & Hudson Consolidated. 103	103
Lake Shore 60%	5936
Rock Island104	103%
Del. Lack, and Western 119	119
Wabash, 5%	516
Harlem131	181
Western Union Telegraph 81%	80
Northwestern	8836
" Pref 501/2	50%
Milwaukee & St. Paul 34%	33 %
" Pref 573%	56
Pacific Mail	4036
Erie 1534	1434
Ohio & Mississippi	2314
Union Pacific 75%	75%
Missouri Pacific 50%	50
C. C. and Ind. Central 4	4
Hanibal & St. Joseph 34	24

GENERAL HARDWARE.

er. es, ain of

br

It is too soon to look for any improvement in the demand for General Hardware. Trade continues in about the same condition noticed last week. There is the usual activity among manufacturers at this time in the preparation of revised price lists for the ensuing season, and our columns this week contain much that is of interest and importance to the

of no change in values of either English of German Hardware.

The following circular explains itself : Office of Alfred Field & Co., 93 Chambers and 75 Reade streets, New York, July 1st, 1875.

DEAR SIRS: We now beg to inform you that our discounts on the Birmingham Screw Co.' Improved Patent Wood Screws are as follows ON IRON.

stock a full assortment of Flat and Roun Head Iron and Brass Wood Screws, Machin Screws and Stove Bolts. He has made as Screws. The following revised discount shee

will be issued under date of 8th instant.

New York, July 8, 1875.

The subscriber offers the following induce-

CASH	DISCOUNTS	FROM	THE	AMERICAN	LISTS.
	lish.				
Flat E	lead lron, g.	uges n	ot ove	r 7 62 16	7 de 1634 %
Flat I	Iead Iron, ga	uges 8 a	and h	eavier62	16 % & 10 %
Flat I	Iead, Blued				6236%
Tinne	d and Galvan	ized			40% & 10%
Roune	d Head Iron				50%&10%
Roung	d Head, Blue	d			5018:5%
Flat B	lead, Brass.				16 T & 10 T
Roune	d Head, Bras				5012.8.B.C
Flat F	Iead, Machine	Pi		30	1.8:19 LC
Roune	d Head, Macl	ine		25	18:12 3ch
Stove	Bolts				254

Subject to changes of market without notice. Terms cash within thirty days in fands at par in New York. Yours, respectfully, GEO. W. BRUCE, I Platt street.

The discount on Maydole's Hammers has The bond market active and firm, with a been increased to 12 per cent., formerly dis-brisk investment demand. There is a strong count 7 per cent., and jobbers are restricted to investment demand for railway mortgages, the newly established figure. Any jobber selland the prices asked and bid for Union Paing at better than discount 12 per cent. will forcifics were the highest ever realized. We give below the closing prices for Governments. manufacturer.

At a meeting of the manufacturers of Cast Iron Butts, held in New York in the latter part of March, a combination was formed and the price of Butts advanced. After making some changes in the list prices, and advancing the goods by a change in the rate of discount, a committee was appointed to revise the whole list and report at the next meeting. As the result of this committee's work we have the revised lists as below, which were adopted by the Cast Butt Manufacturers' Association at their meeting held in New Haven on the 16th of June. The new lists and discounts to take effect from July 1. It will be noticed that the lists are much simplified, as the list price of Broad Fast Joints, Broad Loose Joints and Loose Pin Butts, whether common or drilled, is all the same, instead of a separate list for each as heretofore. These changes are ap-parently made more to better and "even up" the list prices than to advance or reduce the price of Butts, and the effect is to net the regular goods at about the same figures as made in March last, and to advance some of the finer grades, such as Japanned and Japanned with Plated Acorns:

CAST BUTT HINGES-REVISED PRICE LIST, JULY 18T, 1875. Narrow-Fast Joints. Drilled or Common. Per doz.

Per doz.

1nch \$0'45

" '48

" '55

" '56

" '65

" '65

" '80

" '80

" '80

Drilled or	Common.
Per doz. \$1.00 2 Inch \$1.00 2 \(\)	4 Inch. \$2.10 436 " 2.60 5 " 3.25
Mayer Illinges	-Loose Joints.
Drilled or	Common.
Per doz. No. 0, 2 by 3½ in. \$1.50 No. 1, 2½ '' 3½ '' . 160 No. 2, 2½ '' 3½ '' . 190 No. 3, 2½ '' 4 '' . 220 No. 3, 2¼ '' 4¼ '' . 275 No. 5, 3¼ '' 4¼ '' . 3*20	Per doz. No. 6, 3¼ by 6 in\$4'25 No. 12, 2½ by 4½ in. 2:20 No. 14, 2½ '5 in. 2:75 No. 0, Fast Jt. Mayer 1:50 No. 1, '4' 1:60
	tts—Loose Joints. Common.
Per doz. 2% in. when open \$1 '00	5 in. when open \$2.20

~/3	RADA TT AL	DELL OF	COMMAND A CA	DW OW			TOTAL OF	DOME 4	p.e. e.u
236	6.6	46		1.00	516	66	6.6		2.40
9	6.6	6.6		1.20	6	6.6	6.6		2.80
316	66	4.4	***	1.30	636	*4	4	* *	3.20
0.20	66	66	***	1.45	729	4.6	4.6	*	
3/9	64	44	***			**	**	* *	3.80
3%		44	* * *	1.60	736				4:20
4	6.6		***	1.90	8	**	44		4.40
416	44	44	***	2.00	9	4.6	1.6		5.20
			Drill	led or	Com	mon.			
			Fac	st Join	t, it. L	Japani oose J	ned.	Japan with I Acor Loose	la'd
				and		an		an	
			Lor	se Pin	T			Loose	
Inc	1.			r doz.					
Inc	n.		T.G			Per d		rer	doz.
	12			B1:00		\$2.	50		
236	E816			1.10					
2	K236			1.10		2.	65		
2363	c2			1.50		2.	80		
	x216			1.35			00		
216	-3			1.50			15		
m 79;	NG			1.55		0	AU		
	K5%	*****				0.			2.42
	£21/2			1.60			30		6.40
	к3			1.75		8.			6.20
	x836		****	1.95		31	65		7.00
3 :	r4			2.30					
31/	x31/			2.00					
8361				2.15		3.	90		7.50
				2.85			00		
									8.00
316	5.4			2.50		4.	10		8.40
			** **	2.65					
				2.20					
4 :	x336			2.70		4.	70		8:80
				2:90		51			9.20
	x436			8:20			40		9.50
	- M. W.			4.00		-			3 30
9 7	63			4.00		* *			

5.70 6.00 6.60 7.00 7.50 8.00

r	Loose Joint, 1	Japanned, Loose Joint	
	Inch. And Loose Pin, 1	and Loose Pin. Per doz.	
at 's	5 x9 9:00 5½x5 6:00 5½x5½ 6:50	8·50 9·00	13.50 14.00
3:	5\% x6 6.80 5\% x6\% 7.00 6 x5 6.75	****	****
災災	6 x5) ₆	11:00	16.00
1 75	6 x7 8:50 6 x8½ 11:00 7 x6 9:00		****
of	DISCOUNT		
le	Common—Not		
s. in id ne	Fast Joint, narrow. Fast Joint, broad. Loose Joint, narrow and broad Mayer Hinges and Parliament Loose Pin. " "Japanned.	Butts	dis 40&10 % dis 50&10 % dis 40&10 % dis 45&10 % dis 55&10 %
at an et	Mayer Hinges and Parliament	japanned Butts	dis 35&10 % dis 45&10 % dis 45&10 % dis 35&10 %
	Loose Pin Japanned plated tips		dis 50&10 % dis 45&10 %

Oliver Ames & Sons have issued, under date of 1st instant, a revised list and discount sheet of their Shovels, Spades and Scoops. We print below that portion of the list that has been changed; the tables of old and new prices show that all the changes are reductions. The dis count has been increased from 121/2 to 20 per cent. The following is their circular to the

NORTH EASTON, MASS., July 1, 1875.
GENTLEMEN:—On and after this date we shall allow on all of our goods a discount of 20 per cent. from list prices; and on all Scoops, except "Ames," an additional discount of 5 per cent.
We will also allow an extra discount of 5 per

cent. to all parties whose net purchases from us exceed \$500 in six months.

Our terms are net cash, payable in Roston or

	0. A	nes O			ge Plate	d Spade	8.
			E	Black.		**	
						New Price.	Old
vo.	*				No 1, 2, 3, 4,	Per c	Price, lozen.
76.	D. H.	Plain B	ack S	pades.	1.	\$15.75	\$16.00
77,	6.6	4.6	66		2,	16.00	16.50
78,	6.6	4.4	6.6		3.	16.25	16.75
79,	L.H.	44			4,	17.00	17.50
80,	L. H.	66		,		15.75	16 00
OA.	66				eres exten	10.00	16.50
82,	D. H.		46	7	ap2,	16.20	16.75 17.00
84,	66	66	Gr	aft. Sr	ades. 2	16.00	
85,	66	66		66	nades 2.	16.50	17:50
86.	6.6	4.6		44	4,	17.50	18.50
87,	46	6.6	N	are. Sp	Tap. 3	18.50	
88,	**	4.5		66	8,	19.00	19.50
89,	44	**	-		Tap 3.	19 50	
90,	**	44	Dr	un sp	ades1	17 50	18.00
91,		**		44	2,	17:50	18.00
	66	64		**	0	17:50	
93,	66	64	Die	ch. Sn			18.00 18.00
05			Die	cu. op	auce	17.00	
96.	D. H.	66	Bri	ck Spa	des pades. Spd des Sp'd t hand	15:75	16:00
97.	**	5.6	Sub	soil S	pades.	18.50	19:00
98.	4.6	6.6	Mix	ning S	pades.	14.50	15.00
100,	4.6	4.6	Cor	a or P	Spd	15.50	16.00
101,	6.6	**	Boy	ys' Spa	ides	11.50	12.00 12.00 14.00
102,			R'd	point	Sp'd.	16.20	17.00
103,	S. PI	Ba'k Sp	ades, v	vithou	t hand	13.50	14.00
			P	onsneo	1.		
104	D. H.	Plain F	Back S	pades	1	16.75	17:00
		44	66	K	2	17.00	
106.	46	4.6	6.6		3	17.25	17.75
107,	**	44	1	ledge	Sp'ds.2	18.00	18:50 18:00
108,	66	**	1	t'd p't	Sp'ds.2	17.50	18.00
109,	L. H.			pades	1	, 16.75	17.00
110,	L.H.	**	**		Sp'ds 2 Sp'ds 2 Sp'ds 2	17.00	17.50
111,			-		3	17.25	17.75
					ge Plate		
119	n u	Plain F	lack S	o pt	Shov. 2	11:00	11.05
114	16	E MAILE A	MONTH IS	d' be	16 3	11:50	11:25
27	6.6	4.6	R	d p't	11 .1	11:00	11.95
28.	4.6	44			**2	11.50	11.75
129	6.6	4.6		+4	**3	12.00	12:50
135,	L. H.	**	Se	1. p't	8 9	11.00	11.25
36,	44	**	-	**	"3	11.50	11.75
40,	.4		R'd	point	2	11.00	11.25
41,	T	n a a		C1.	3.	11.50	11.75
142,	D. H.	B. S. S	d. b.t	Shove	18 1	11.00	11.25
143,	44	44	44			11.20	11.75
199,			-			15.00	13,20
					7.5		
[50,	D. H.	P. B. S	q. p't	Shove	ls2	12.00	12.25
	44	4.6	44	**	* * * * * * * *	1.6 00	1.6 (1)
152,	44	" F	d pt	**		, 12.00	12.25
153,	**	**		**	2	13.00	12.75
154,	r	11 0		**		13.00	13.25
50,	L. H.	8	d. b.t	**	2	15.00	12.25
150	L. H.	I	'd n'e	**		12.00	12.75
159, 160,	64	14	abe	**	3	12:50	12.25
100,					1111 0	12 00	14 15
	T. 1	I. Porte			ge Plate	t Spade	8.
				Black.			
61.	D. H.	Plain B	ack S	pades.	1.	11:50	12:00

			* 0	****	59.6			D. T. Pall III	
50.	D. H.	P. B.	Sq. p't	Shove	els2,	12:00	12.25	REPAIRSW	
51,	4.6	4.6	***	44	3.	12:50	12.75	parts furnished	
52,		6.6	R'd pt	8.6	1,		12.25	BAILEY	W
53.		64	re a be	40	2,		12.75	Danie	lo. 1
54.	**	6.6	4.6	4.6	3,	13.00	13.25		
56.	L. H.	6.6	Sa n't	44	2,		12.25	We are indeb	ted
57.		44	Sq. p't	**	3,	12:50			- # 4
59,	64	4.4	R'd p't	44	2.		12.75	vance sheets	
		44	wa be	**		12.00	12.25	Wheeler & Co	0.
60,					3,	12.20	12 75		
	T. 1	F. Por	terSte	el-Ke	ige Plated	Spades		and, owing to	the
				Black		- You wen		give below only	v th
61,	D. H.	Plain	Back St	ades		11.50	12:00	importance to	our
62,	6.6			**	2.	11.50	12.25	PRICE LIST	OF
63,	4.6			**	3,	12.00	12:50	Treated made	~ A
64,				**	4,	13.00	13.20		
65.			4	1.6		11.50	12.00	DOOR LOCKS, LA	TOTAL
66,		4	6	**	2,	11.50	12.25	Down Locke, La	A C AAA
67,	66	4	*	16		15.00	12:50		
68,	4.6		4	**	4,	13.00	13:50	No. Per doz.	1 No
69,	DH	PR	Grafting	Sno	des 1.	11.50		0 60.00	
70.	16	14				11:50	13.20	1 5.75	
71.	46	66	**		2,		14.00		
72.	6.6	4.4	**		3,	12.00	14.50		
200		44.0	Concave	D:	0.11.4,		15.00		
73,	66	44.3	Oncave	or F	sp'ds.	12.00	12.20	01% 7.00	1
74,			Diamond	D.f.	l Sp'ds.		13.50	01% 7'25	
75,	66	***	Nursery 2	pade	8 2,	14 50	15.00	1% 7.25	
76,					3,	15.00	15.20	2 30.00	
77,		44	Drain Sp	ades	1,	14.00	14.20	8 5.50	
78,		66	44		2,	14.00	14.50	03 5.25	
79,			44	,	3,	14.00	14:50	3% 9.00	
80,	6.6	4.6			4,	14.00	14.50	4 60.00	1
81,		I	Ditching	Spad	es	14.00	14.50	5 7:00	
	T. H.	6.6	**			15.00	15.50	05 6.75	1
83,	D. H.	**]	Hedge Sp	pades		14.00	14:50	6 15.00	1
84,	66	** I	Boys' Spi	ides.		10.00	10.20	7 12:00	1
,				lishe				8 48.00	
								9 50.00	
	D. H.	Plain	B'k Spa	des .		13.20	13.00	10 62:00	
86,	4.6	4			2,	12.20	13.20	11 8:00	
87,	44	6			3,	13.00	13.75	12 72.00	
88,	1.6				4,	14.00	14.50	13 9.50	
89,	L. H.	6				12.50	13.00	14125.00	
90,	6.6		6 66		2,	12.50	13.50	15 12:50	
91,	4.6	4			3.	13.00	13.75	16 21:00	
92.	D. H.	6	Hedge	Spad	es2,	15.00	15.50	1636 21:00	

"Narsery Spades....2, 15.50 16.0 "Diamond p't'd Sp'ds 13.50 14.5

Naylor.-Iron Back Strap Shovels and Spades

675, D. H. Grafting Spades, Black ... 2, \$8:00 \$8:5676.

010	Ganda	Western .					410.00
	Sande	rson's Bes	rat l	, man			\$12.00
811,				***	3,		13.00
815,		**	14	Blac	k 2		11.50
816,		**	**		3	13.50	12.20
	O. Am	es Drain	age (and D	itching	Tools.	dec.
90.	D. H.	Plain Bac	k Dr	ain Sr	pades.1	\$17:50	\$18.00
91,	44	61		**	2	17:50	18:00
92,	6.6	64		84	3		18:00
93.		44		44	4		18.00
94,		14	Dit	tch'e !	Spades		18.00
	T. H.	6.6	2011	24	pauco	18.50	19:00
		"cave Soc"	t Cle	aners	to pusl		
820.		44		44	pull.		18:00
821.		quare Soc	ket	64	push		18.00
822.	86	**		6.6	pull.		18:00
	Steel	Edge Post	Hole	Spie			
		Spoons for					
Course		iddleboro		10			

The following circular is about to be issue by the manufacturers of Clothes Wringers :

by the manufacturers of Clothes Wringers:

About a year ago prices of Wringers wer cut to a very low figure, not on account of any decrease in cost of manufacture, but in consequence of dissensions among the owners of the patents controlling their manufacture.

These differences having been reconciled, the price is to-day restored to its former figure viz.: \$72 per dozen for 10 inch Cog-whee Wringers; \$60 per dozen for 10-inch Friction Wringers (\$1 per dozen added by jobbers wes of and including the cities of Buffalo, Pitts burgh and Wheeling). All jobbers are required to adhere strictly to these prices, as by agree ment such as do not will lose all drawback due them, and be refused a further supply of licensed Wringers on any terms.

METROPOLITAN WASHING MACHINE CO.
PROVIDENCE TOOL CO.
July 7, 1875.

July 7, 1875.

We invite the attention of the trade to th dvertisement of the Bailey Wringing Machin Company on page 16. This Company, we ar informed, are now the largest manufacturers of Clothes Wringers in the world. They manufact ture twenty-three different styles and size adapted to the uses of families, hotels, laundrie and factories. Among the recent improv cent. to all parties whose net purchases from us exceed \$500 in six months.

Our terms are net cash, payable in Boston or New York funds; we reserving the privilege of drawing at sight, with exchange, for all bills not paid within 15 days. Interest from date, at 7 per cent., will be charged on all invoices not paid promptly.

We prepay the freight on our goods to Boston or New York, but all goods are at risk of purchaser after shipment from the factory.

All orders will be filled at the prices ruling at the date of shipment.

We would call particular attention to our Patent Welded Cast-Steel Smooth Back Shovels and Spades, as being the only Cast-Steel goods of the kind in the market. They are particularly adapted to railroad work, being very staff and strong, and at the same time much lighter than the old steel-edged goods. We can furnish an unpolished Shovel of this style at \$16 per doz., list.

Yours, respectfully,

OLIVER AMES & SONS.

O. Ames.—Cast Steel Edge Plated Spades.

	Size of Roll.		Wholesale, dozen.	
	Length.	Diameter.	Less than 2 dozen.	2 doz. or more at 1 shipment.
Novelty Wringers, with Round or Square Tul	Curv	ed (Clamp, ches this	Will fi
No. 1, No Cog Wheels No. 2, With Cog Wheels No. 3,	10		72.00	\$58.00 70.00 78.00
Novelty Wringers, with 8 Round or Square T	trai	ght	Clamp. hes thick	Will fi
No. 1%, No Cog Wheels No. 2%, With Cog Wheels No. 3%,	10 10 11		60.00 72.00 80.00	58.00 70.00 78.00
Excelsior Wringe	ers,	with	Bench.	
No. A, New size	10 11 11 12	1% 1% 2% 2%	86.00 94.00 110.00 144.00	84:00 92:00 107:00 141:00
Excelsior Wringe	rs. f	or S	et Tubs.	
No. E, Formerly No. 4½ No. F, New size No. G, Formerly No. 3½ No. H, 'No. 3 No. J, New size	10 11 11 12 14	1% 1% 2% 2% 2% 3	78.00 86.00 102.00 134.00 240.00	76 00 84 00 99 00 131 00 287 00
Sherman Wringers	, wit	h Ire	n Frame	
No. 1, No Cog Wheels No. 2, With Cog Wheels No. 3,	10 10 11	1% 1% 1%	72.00	58.00 70.00 78.00
Large Wringers, for Hotel Use. With Ste	el, L	aund	ry and F	actory
No. 0 For Set Tubes	10	lod I	Each.	Each.

N. B.—An order for two dozen must filled at one shipment, but may include any the above kinds or sizes. Wringers deliver at New York, Boston, Providence and Woo TERMS.—Time, 60 days. Two per cent. di count if payment is made within 30 days.

REPAIRS.—Wringers of all kinds repaired, or parts furnished.

VRINGING MACHINE CO. 106 Chambers St., New Yor d to Sargent & Co. for a the revised list of Mallor The list is a very full or e pressure on our space. nat portion of the list of mo

readers:

DOOR LOCKS, LAT		NOBS.	E BOLTS WITHOU
No. Per doz.	No.	Per doz.	No. Per do
0 \$2.00	21	33:00	Miceral.
1 5.75	22	49:00	54 14
01 5.75	24	43.00	
01% 5.50	26	22:50	White.
01% 7.00	27	30:00	54 17
0136 7'25	28	15.00	-
1% 7.25	29	20.00	55 87
2 30.00	30	38:00	
8 5.50	31	48.00	Mineral.
03 525	32	20.00	56 27
314 9.00	33	30.00	
4 60.00	34	78.00	White.
5 7.00	35	80.00	56 30
05 6.75	36	93.00	
6 15.00	37	92.00	57 10
7 12:00	38	81.00	*58 16
8 48.00	39	50.00	59 9
9 50.00	40	99.00	60 21
10 62.00	41	34.00	61 10
11 8.00	42	200 00	62 . 27
12 72.00	43	44.00	63 9
13 9.50	44	225.00	64 26
14125.00	46	50.00	65 35
15 12.50	47	62:00	66 50
16 21:00	48	62.00	66% 11
16½ 21·00 17 14·50	49	150.00	67 14
40	50	50.00	68160
40 00.00	51	138:00	69 22
19 26.00	53 533	64.00	*71 32

7'00		24.00	669		2095	8.0
7.00	172 173 174	18·00 8·00 10·00	662 665 666	. 24.00 . 36.00 . 42.00	2093	er set
7:00	170 170 171	5·00 6·50	631 659 660	. 60°00 . 46°00 . 72°00	2052 2053 2069 2092	8 2 28 0
loz. 4.00	166 5 167 168 1	8.50 18.00	625 628 629 630		*2006 2009 2050 2051	18.50 4.50 6.00 7.00
UT	163 164 1	3·75 5·00 10·50 6·50	620 621 624	18.50 21.50 20.50	1999 2000 *2004	16.00 19.25 13.50
3	159 160 161 162	6.00 6.50 4.75 8.50	606 608 610	27.00 27.00	*1924 1997 1998	14:50
we ost	156 157 158	5.50 4.25 5.50	603 604 605	26.50 29.25	*1700 *1701	2.50
ry,	153 4 153½ 6 154	18:00 30:00 4:25	601 602	15.50 17.00 13.50	*1554 1660 1665	4·00 3·50
rk.	150 1 151 1 152 5	17:00 20:50	594 595 600	9.75 15.50	*1541 *1543 *1553	5.00
is- or	148 1 149 1 149½ 1	11.00 17.50 17.00 15.00	599 590	16.00 14.00 18.00	1480 1482 1484	9.00
ed n-	144 i 145 i 146 i	7·50 12·00 15·50	585 587	16.00 13.60 12.50	1443 1453 1454	4·75 5·50 6·50
be of	140 1 141 1 142 1 143 1	5.50 4.50 7.50	582 583	7·50 7·50	1409 ···· *1424 ····	Each . 50 -85 4:00
10 i0 i0 i0	136 2 138 3 139 2	2.00 12.00 10.00	580 581	6.00 20.00 10.00	1093½	7.00
h.	128½ 129½ 182 1 134 2	9°50 8°00 7°50 2°00	574 576 578	20·50 23·25 18·50	1092 Pe	2.75 r set.
00 00 y	127½1 1281	9·50 6·25 6·00	5554 555	38.00 38.00 38.00	*1086 *1087 1091	2.00 1.50 2.50
00	125 1 126 3 126½ 1	4.00 6.50 0.00 1.25	527 541 543	59 00 38 00 48 00	*1065	14.75 Each
00 00 00 00	100	3.00	524 525 526	43.00 47.00 53.00	*1062 *1063 *1064	13.50 8.75 11.75
00	Mineral. *121 4	0.00	520 521	27.00 33.00 49.00	1057 1058 *1060	36°00 39°00 7°50
00 00 00 0	*119 8		510 511 512 513	56.00 72.00 66.00	1058 1054 1056	28.00 31.00 33.00
00_	Mineral. *119 3 White.	2.00	508 509	42.00 48.00 50.00	1047	6.00
0 0	117 1	4°25 8°00 4°00	504 504 % 505	54.00 52.00 60.00		Each. 9.00 10.25
0 0 0 fit	113 1 114 2 115 1	0 00 1 00 3 50	501½ 503	41.00 48.00 46.00	1030 1031 1032	12·50 12·50 14·50
fit 0	11236	4·50 5·75	491 500 500½	19.50 40.00 38.00 43.00	1026 1027 1028 1029	9.50 9.00 12.25 10.50
0.	110 111 0111	8·75 7·50 3·75	484 486 490	60.00 72.00 16.50	1023 1023½ 1025	6.00 7.50 7.50
	107 1 108 1 109	0.00 2.50 5.75	472 480 482	18:00 96:00 111:00	*1018 *1021 *1022	27:00 21:00
-	104 105 105½ 106 1	3.75 3.75 4.50 8.00	422 466 468	40.00 24.00 18.00 24.00	*1001 *1006 *1012	12 00 14 00 12 0 13 0
er	101 102	6.00 8.00 2.20	419 420 421	26.00 29.00 48.00	*998 *999	11.00 9.00 11.00
y:	98 99 100 1	9·00 4·00 3·50	253½ 415 416 418	14.00 27.00 21.00 46.00	99436···· *995 *996 *997	7.50 8.00 10.00 11.00
ity	96 1	6·50 0 2·50 0	251½ 251½ 251¾	8.50 10.25 9.75	993 993½ 994	7:00 8:50 6:00
we	***********	4.00 0	247¾ 249 249 251	8·50 12·50 12·50 12·00	987 988 989	14.50 12.50 9.50 8.00
e y he	Brass.	9.00 0	247 24714 24716	10.50 7.25 9.00	*979 *980 *981	11:50 12:50 14:50
em eh	Hand Pl'd.	7.00	243 ½ 243 ¼ 245 247	8.75 8.25 12.00 10.50	*974 *975 *976 *977	8.50 10.50 11.50 13.50
p- by ch	95 19 Elec. Pl'd.	9.50 0	241 243 243½	10.50 10.00 7.00	*971 *972	9.50- 10.50- 12.50-
ts n-	94 . 2 Brass. Per	1.00 0	239 ½ 239 ½ 239 ¾ 241	5.75 7.50 7.00 10.50	960½ 964 964½ •970	7:00 6:50 8:00 7:50
e- h-	Hand Pl'd. 093% 2	4.00	237 239	17:50 8:50 8:50	956½ 957 960	38.00 56.00 5.50
es es	Elec. Pl'd.		230 231 233 235	10.50 12.50 14.50 15.50	954½ 955 955½	32.00 48.00 34.00 52.00
of	93½ 30 Brass.	0.00	228 228 229	9.00 9.00 21.25	953 953½ 954	44.00 30.00 46.00
ne ne	93½ 19 Hand Pl'd.	5.20 0	223 223 225	10.50 10.50 12.00 18.50	938	96.00 111.00 72.00 60.00
	Brass. 193½ 195 Elec, Pl'd.	5.00	217½ 219 221	12·25 12·50 15·25	926 927 928	12.50 12.00 15.25
of	Name and Address of the Owner, where the Owner, which is the Owner, where the Owner, which is the Owner	3 50 0	215 215½ 217	7.50 9.50 9.00	884 887 925	11.50 13.50 10.50
e-		2.50	213 214 215	7·50 8·75 7·50	879 881 883	15.20 6 20 10.20 8.00
st s-	Brass.	7.50 0	210 211 211 212	5.25 6.00 6.00 6.75	*844 *845 *846	13.50 9.50 12.50 15.50
e, el on	Hand Pl'd. 93 4	4.00	207 208 209	5.00 9.50 5.50	*842 *843	6.00 7.50 10.50
he	Elec. Pl'd.	3.00	204 205 206	5:00 5:75 8:10	*830 *831 *832	17:50 17:25 20:25
re ny e-	Brass. Per	set. 8:00	198 199 200 202	9°50 10°00 11°00 4°00	*826 *827 *828 *829	15.50 14.00 17.00 14.50
ed	*91 21 *001 20	0.00	194 195 196	5 75 5 75 6 25	784 787 *825	10:50 12:50 12:50
ds	87 11 88 2	5·00 1·00	191 192 193	11:50 8:50 14:50 4:50	718 779 781 783	30 00 5:50 9:50 7:00
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267 465 23 00 1195 10 00 tached, Spring Shackles, 467 30 00 1196 12 00 No. 16,24 in Sanction	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
268 21 00 473 50 00 Per pair No. 17, 2½ in. Same as No. 5, with X 24 00 542 10 50 1200 400 No. 18, 2½ in. Extra Fine, 4 Tumber No. 18, 2½	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
270 Per pair. 1208 400 No. 57, 2½ in 2 Wheels, Tumbler. 12271 Per pair. 2.75	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
273 42·00 1127 2·15 2012 4·00 No. 80, 3 in. Brass Drop. No. 8, 274 27·00 1131 2·75 2016 4·50 276 277 42·00 1131 2·75 2018 5·00 No. 3007, 2½ in. Brass Bushed, Fanger 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
281 1.75 1135 2.75 2022 5.50 drical Key, Extra Fine 282 3.50 1139 2.50 2024 5.50 285 2.00 1141 2.50 2026 15.50 Patent Pad Locks, Brass Keys, with Ca	172 New 450 523 1800 0800 New 173 New 750 526 2000 801 New 1750 526 2000 801 New 1750 526 2000 802 201 6506 Bit. 201 750 531 850 804
Mineral.—Japanned Mountings. No. Per doc. No.	203 10 00 541 10 50 806 204 13 00 541 12 00 900 210 7 50 543 22 00 901 211 7 50 543 25 00 902 25 3 75 213 9 00 544 95 90 902 25 3 75 213 9 00 544 95 90 902 25 3 75 213 9 00 544 95 90 902 25 3 75 213 9 00 544 95 90 902 25 3 75 213 9 00 544 95 90 902 25 3 75 213 9 00 544 95 90 902 25 3 75 213 9 00 544 95 90 902 25 3 75 213 9 00 544 95 90 902 25 3 75 213 9 00 544 95 90 902 25 3 75 213 9 00 544 95 90 902 25 3 75 213 9 00 544 95 90 902 25 3 75 213 9 00 544 95 90 902 25 3 75 213 9 00 544 95 90 902 25 3 75 213 9 00 544 95 90 902 25 3 75 213 9 00 902 25 213 9 00 902 25 213 9 00 902 25 213 9 00 902 25 213 9 00 902 25 213 9 00 902 25 213 9 00 902 25 213 9 00 902 25 213 9 00 902 25 213 9 00 902 25 213 9 00 902
220% 4.50 220% x 4.50 222% 4.50 Bridge Wards, Brass Key, with Cast Steel Bit, 8 Pearl White.—Plated and Porcelain Mounting	21.3 12·00 547 28·10 1001 21.4 14·00 548 45·00 1003 21.5 17·00 549 41·00 1004 21.6 20·00 559 47·00 1009 2 5·44 224 13·00 1005
444 \$7.25 248	225 15·00 552 35·00 1012 1 226 18·00 553 35·00 1016 1 227 21·00 554 38·00 1017 1 260 7·00 555 41·00 1018 1 261 6:50 47·00 1018
No. Per doz. No. Per doz. No. 2700, 3 in. Brass Bushed and	050 3775 557 5790 1021 11 352 575 561 18 00 1024 17 355 4700 565 21 00 1025 17 358 5725 569 21 00 1025 18 00 1025
No. 2800, 2% in. Brass Bushed Enti	370
236 1/4 6 50 2 Patent Double Cast Steel Bit, 6 kinds to dozen 5 '00 Patent Pad Lock, with Double Cast Steel Patent Pad Lock, with Double Cast Steel Bit, 6 kinds to dozen 5 '00 Patent Pad Lock, with Double Cast Steel	No. Esculcheons.
964 Per doz. No. 265 Per doz. No. 2900, Improved, 2½ in Brass	2 Keys. Per Doz. No. Per doz. No. Per doz
10	301. 3:00 310. 12:00 410. 12:00 410. 12:00
266 \$60.00 266 \$63.00 er doz. No. Per doz. 267 \$81.00 er doz. No. Pearl White.—Plated Mountings. No. Per doz.	510. Per doz. No. Per doz. 511 \$3°25 512. Per doz. \$9°00 \$9°00 \$9°00
442 6.75 z 12.00 342 12.00 Fancy Engraved Drop. Patent Rotating Key Hub	No. Per doz. No. No. No. Per doz. No. No. No. No. No. No. No. No. No. No
No. Per doz. No. Per doz. No. Per doz. Pratent Rotating Kov. 121.00	3.81 Silver Glass Knobs—Haines Patent Solid Silver Glass Knobs with Nashua Special Pattern Money ings—Outside or Leave to the Special Pattern Money in Special Pattern
Clast Door Fast	We learn that injunctions have been granted against John Young, of Amsterdam, N. Y.
253 9-98 are \$3.00 259 Proper No 2004 Cast Steel Keys, suspended com	of John Young & Sons, and has manufactured to
Size. Mineral. And Bridge Ward, Solid	patents. Three of these injunctions were in at favor of the Metropolitan Washing Machine
1% inch. Brass. Der der Asses. 10 Facilit Rotating Key Hub and Bridge Ward, Solid Cast Steel Keys, assorted 1. No. 300e 12 Kinch Cast Steel Keys, assorted 1. No. 300e 12 Kinch to the dozen	Bailey Wringing Machine Co., of Woonsocket, R. I. BRITISH IRAN
Size. Per gross. Siz:. Per gross. Patery Engraved Drop. Pater Rotting Key Hub and Bridge Ward, Solid Cast Steel Keys, assorted	Scotch Pig. WEDNESDAY, July 7, 1875.
1% inch Silvered Glass No. 0000 Pad Lock Keye. Per gross	done since last report. Prices are steady. Cop
1½ inch. Hand Plated. No. 5, 6, 7, 9, 10, 11, 14, 17, 2900, 3001, 3002, 3007, 672	Eginton No. 1 69/ T
Mineral. Mo. 2300. 10 00	pected that there will be a reduction of 20/man. morrow (Thursday)
Size No. 0000 to 8 8.77	Rails—Remain as reported last week, viz., has dare fr
No. Per doz No. No. 40 Asserts No. 40 Asserts	American Pig. — The production of Pig Iron in the Lehigh Valley is now less than at any time since about the year 1853. The Iron of all Companies seem to have realized.
808	Companies seem to have realized the fact that their only salvation is in a large reduction of their cutput continues.
William Wilcox & Co., Middletown, Conn., have issued the following revised list and discounts for their Common and the same and discounts for their Common and the same and discounts for their Common and the same and	companies at this writing is as follows: Companies. No. of Furnaces In Plantage The Plantage In Pl
1st instant: Per doz. U. No. 35, 40 and 45	ilendon 5 3 mon, 11 5 keystone 5 3 mon, 11 5 keystone 1 5 5 1 5 keystone 1 5 5 5 5 5 6 5 6 6 6 6 6 6 6 6 6 6 6 6
No. 0000, 2 in. Self-Locking Spring Shackle, assorted Keys. No. 000, 2½ in. Brass Drop. 150 Show the self-Locking Spring Shackle, assorted Keys. \$1.05 \$1.18 \$1.18 \$1.18 \$1.18 \$1.18 \$1.18 \$1.18 \$1.18 \$1.18 \$1.18	arter
No. 1, 2% in. Brass Drop. 175 No. 2, 2% in. Brass Drop and 190 183 within ten days after receipt of eductions to be made of the following is the revised List of the Cargo No. 1, 2% in. Brass Drop and 213	
No. 4.26 in Made 1992 230 See Of 45 per cent. Other discount on of 45 per cent. Other discount on the first of 45 per cent. Other discount on the first of 45 per cent. Other discount on the first of 45 per cent. Other discount on the first of 45 per cent.	
on the following numbers. A new list is in the meantime attach this sheet to list of loop the following numbers. As new list is in the meantime attach this sheet to list of loop the following numbers. As new list is in the meantime attach this sheet to list of loop the following numbers. As new list is in the meantime attach this sheet to list of loop the following numbers. The list has been changed preparation and will be issued in a short time.	Juless a very marked improvement occurs in condition of the Iron market, which is not be the Iron market in Iron mark
LOCK CO. little	c change in the above state of production

J. Clark Wilson & Co., No. 81 Beekman street, for some months to come. Coal has been reare Agents for these goods in this city, and carry duced to \$2.75 at Mauch Chunk, 50 cents per a full assortment in stock. ton less than the month previous to the strike. This reduction is borne entirely by the miners No.
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902 and the operators. The carrying companies, who have been declaring their two and onehalf per cent. dividend quarterly, regardless of the strike, do not seem disposed to share any part of the burden of reduction. They are fully aware that cheap coal is a vital point to the furnace companies. It is in the range of possibility, and it has been suggested, that perhaps these carrying companies desire to add the manufacture of Iron to their transportation business, and, as an easy method of obtaining control of the furnaces already built, use their great power toward making the business an unprofitable one for the present. The demand continues small, but in some

rates, but there is a considerable quantity of Iron in second hands that can be bought at a concession, and the weaker companies are also shading prices. We quote No. 1 Foundry \$26 @ \$28; No. 2 Foundry, \$25 @ \$26; Gray Forge, \$23 @ \$25; White and Mottled, \$21 @ \$22. We note sales of 500 tons Mottled on private terms; 200 tons Carbon No. 1 Foundry at \$27.50, and 200 tons Poughkeepsie No. 1 Foundry at \$27. Scotch Pig.-Advices from the other side have encouraged holders here, and a better feeling is apparent. We quote Coltness \$31.50 @ \$32; Glengarnock, \$32.50 @ \$33; Gartsherrie,

\$31.50 @ \$33; Eglinton, \$30 @ \$31. We note sales of 150 tons Coltness at \$31; 100 tons do. at \$31.50; 50 tons do. at \$32, and 100 tons Eg-Bar.-We quote Refined Bar, 2.6c. @ 2.8c.

Rails.-There is no great activity in this market. We note the sale of 500 tons Ameri can, 56 lb., on private terms, understood to be about \$50 delivered here. We quote, \$47@

Old Rails.—There has been nothing doing in this market, and we continue our quotation Scrap. We continue our quotation of \$30 @ \$31. There is nothing to report.

METALS.

Copper.—The warm weather and the usual tagnation inseparable from the national holiary have contributed to intensify the dullness at the Copper market and the dullness and the Copper market and the usual copper m stagnation inseparable from the national holiday have contributed to intensify the dullness in the Copper market, and throughout the various branches of the metal trade. The outlook is, however, by no means a discouraging one; the fruit and grain crops are, on the whole, No. Per doz. 405.....\$12 00 410.....12 00 promising. There has been no overtrading in any one department of commerce. If the peo- Fra ple at large have not prospered much, they have, on the other hand, economized, and are all the better prepared to replenish supplies for their individual necessities. It is, therefor their individual necessities. It is, therefore, conceded on all hands that stocks in the hands of consumers have been allowed to run low, and this applies in an equal measure as much to the manufactures of Copper, we are informed as it does to other articles in the large manufactures. much to the manufactures of Copper, we are informed, as it does to other articles in the metal trade. The expectations as regards the coming fall campaign, although not sanguine, are far from being the reverse, and a fair amount of business is looked forward to, if not an average one. Meanwhile the manufacturers are cases, 1 Relmun E. & Co. an average one. Meanwhile the manufacturers of and dealers in Copper are known to hold but moderate stocks, and, however indifferent they may at present appear to replenishing them, it cannot last long—at the utmost a month or six weeks—and they will be children. Cases, 1 was month or six weeks—and they will be children. month or six weeks-and they will be obliged to re-enter the markets, even if but to a moderate extent. Holders are quietly waiting for the advent of this demand, and show no mis-Co., New York city, and two in favor of the givings on the subject. Meanwhile the week's sales have been restricted to but 100,000 pounds Lake, in lots, at 221/4c. @ 23c., at which the market closes quiet and steady. Baltimore, in small lots, sells at 23c. Nothing has been done in futures, which remain 231/c., nominally, little offering. London remains steady at £82, 10/ for Chili bars, and £90 for Best Selected. Manufactured is quiet at the following rates: New Copper Sheathing, 30c.; Bolts and Braziers, Sic.; Bronze and Yellow Metal Sheathing, 22c.; and Bolts, 28c.

has declined at London from £83 to £81, as we &c., are in little request, and have a downward are informed by cable, while Singapore, from tendency. Dealers have received notice from the mills to cease shipping any more stocks American Pig. — The production of Pig case with Turn Plates. In our own market Tin had of the reduced supply, and 2000 states that at their only salvation is in a large reduction of their cutput, and "blowing out" is own to carry market their only salvation is in a large reduction of their cutput, and "blowing out" is own to carry market their only salvation is in a large reduction of their cutput, and "blowing out" is own to carry market their only salvation is in a large reduction of their cutput, and "blowing out" is own to carry market their only salvation is in a large reduction of their cutput, and "blowing out" is own to carry market their only salvation is in a large reduction of the cutput, and "blowing out" is own to carry market their only salvation is in a large reduction of the companies at this writing is as follows:

Companies Frances. In Blast. Out. (See Sec. 1) (Sec. 1) (Se is thus unfavorably affected, the reverse is the until further orders, as they are completely

Lead.—The market has been very nearly at a stand-still, sales having been confined to some construction of the stand-still, sales having been confined to some construction of the standard still, sales having been confined to some construction of the standard still, sales having been confined to some construction of the standard still, sales have at 6% c. c. currency. Soft Lead at St. Louis is firm at 6% c., currency. Soft Lead at St. Louis is firm at 6% c., currency. We have seen samples of St. Louis Smelting and Refinipurposes sells here at 7.40c., currency. We have seen samples of St. Louis Smelting and Refinipurposes sells here at 7.40c., currency. We have seen samples of St. Louis Smelting and Refinipurposes sells here at 7.40c., currency. We have seen samples of St. Louis Smelting and Refinipurposes sells here at 7.40c., currency. We have seen samples of St. Louis Smelting and Refinipurposes sells here at 7.40c., currency. We have seen samples of St. Louis Smelting and Refinipurposes sells here at 7.40c., currency. We have seen samples of St. Louis Smelting and Refinipurposes sells here at 7.40c., currency. We have seen samples of St. Louis Smelting and Refinipurposes sells here at 6% c. for Bay seen samples of St. Louis Smelting and Refinipurposes sells here at 6% c. for Pipe, and 9% c., Sheet, less to standard stand quarters we hear of more inquiries. The strong furnaces are holding pretty firmly to the asking

for Bar, 9½c. for Pipe, and 9½c., Sheet, less pet ter and Zinc.—The Zinc Association's combination figures, established at Chicago at the end of last month, are 7.45c., 30 days, and for Domestic Speiter. At these rates the metal as sells slowly, and it is doubtful whether an astimulate much the demand at this precise is sells slowly, and it is doubtful whether an astimulate much the demand at this precise in the week preecding the laiest mail accounts on the week preecding the laiest mail accounts of the week preech precise at the week preech precise at the week preech precise at the laiest mail accounts of the week preech precise at the laiest mail accounts of the week preech precise at the laiest mail accounts of the week preech precise at the laiest mail accounts of the week precise at the laiest mail accounts of the week precise at the laiest mail account acting.

Antimony.—A good steady demand has been noticed, and although the quantities sold, mostly at 131/cc., gold, are not large, the stock, in the absence of fresh supplies, rapidly diminishes. It will cost upward of 14c., gold, to replace it.

IMPORTATIONS.

Steel.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending July 6, 1875: Nightingale & Kelton,
Bars, 1117
Naylor & Co.
Rod colls, 1448
Bars, 15.372
Rails, 1100
Phelps, Dodge & Co.
Sheet, bdls., 464
Wright C. L. & Co.
Swedish bdls., 1
Swedish bdls., 2
Order.
Rod colls, 525
Bars, 324
Bars, 324
Bars, 324
Steel. Hardware.

Hardware.

Alden, Sampson & Sons,
Chains and screws,
ce, 2

Boker Herman & Co.
Mdsc. pkgs., 10

Arms, cs., 7

Packages, 5

Blumenthal I. & A.
Cases, 2 Cutlery, cs., 1
Dreyfus Bros. & Weiller,
Cases, 4
Ehrmann J. & Co.
Cases, 1
Folsom H. D.
Guns. cs. Folsom H. D.
Guns, cs., 4
Fuller Bros.
Cases, 2
Frasse P. A. & Co.
Files, cks., 1
Field A. & Co.
Packagon, 16 Packages, 16
Godfrey E. & Sons,
Casks, 1
Green H. & Sons,
Anvils, 53 Mdse. pkgs., 11 Western Union Tele-graph Co. Galvanized wire, lots,

Manufactured from.—Inere is very little of the manufacturers have resolved to reduce sales of Old Metals have been very light the past week, and dealers find it an impossibility possibility no matter how great many others have begun to suspend operations to dispose or any quantity, no matter now great altogether, in consequence whereof Straits Tin the concessions may be. Rags, Paper Stock, are in little request, and have a downward many others have begun to suspend operations to dispose of any quantity, no matter how great

Wolff S. W. Casks, 10 Order. Casks, 2 Packages, 2 Files, cas., 2 Iron. & Heinleit Scrap rails, tons, 28
Scrap, tons, 45
Irwin R. & Co.
Pig tons, 150
Laughland & Co
Hay bands, bdls., 423
Marvel Wm. D.
Ore, tons, 305 Order.
Tin plates, bxs., 1998
Tin plates, cs., 53
Tin, elabs, 1909
Without Bills of Lading.
Tin, bxs., 4936 Tin.—The production of Tin Plates having We have nothing new of any consequence to

Brown Wm.
Bundles, 198
Cases, 16
Eggers & Heinlein,
Scrap, Ibs., 7660
Hale M. E.
Cases, 17
Hugili Chas.
Cases, 17
Bundles, 158
Bundles, 158
Bundles, 158
Bundles, 159
Robbine, Ca Co.
Bundles, 220
Robbine, Ca Co.
Wire, & Co.
Bundles, 4
Sanderson Geo.
Packages, 29
Packages, 29
Woodford W. O.
Cases, 24
Bundles, 48
Order.
Scrap, spring, tons, 49
Bundles, 549
Bandles, 549
Bandles, 549
Bars, 3 Bathles, 549
Bars, 3

Metals.

Alexandre F. & Sons,
Copper, bars, 50
Byrne Joseph & Co.
Tin plates, bxs., 751
Babcock B. F.
Tin, bxs., 700
Bear J. & Sons,
Tin bxs., 32
Cort N. L. & Co.
Tin, bxs., 975
Eggers & Heinline,
Scrap, brass, bs., 549
Foulkes Jas. & Sons,
Grap, copper, bs., 1
Hurst F. W. J.
Tin, slabs, 222
Phelps, Dodge & Co.
Tin plates, boxes,
10,703
Order.
Tin plates, boxes,
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Tin plates, boxes, Manufactured Iron.—There is very little of the manufacturers have resolved to reduce sales of Old Metals have been very light the

princip offered Rails ar difficult Prices f Pig BARS. OLD SCRAP ality. The sa is for ore nu 500 ton

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5th of July; but at the same time they have not advanced the price of Coal in the market over last year's rates.

The quantity of coal sent from the Schuylkill region the last week was by rail 84,084 tons; Caual, 9710 tons; for the week, 93,794 tons, against 102,395 for the corresponding week last year.

The supply sent from all the regions for the week was, Anthracite, 380,021 tons; Bituminous, 89,429; for the week, 469,450 tons, against 467,895 tons for the corresponding week last year. Increase, 1591 tons.

The supply sent from all the regions so far this year foots up 7,885,704 tons, against 10, 249,822 tons to same period last year. Decrease, 2,864,118 tons. The decrease in Anthracite is 2,440,324 tons.

the Coal companies which are represented by Frederick A. Potts, 110 Broadway, for delivery during the month of July :

	Lump.		Steamer.		Broken.		Egg.		Stove.		Chestnut.		Chest, No.	
* A W C Cole	1	\$	1	\$	1	8	1	\$	1	\$		8	1	\$
L. & W. C. Co.'s, Wilkesbarre	5	00	5	10	5	20	5	35	5	80	4	80	4	00
L. & W. C. Co.'s, Old Co. Lehigh	5	65			5	45	5	45	5	80	5	00	4	00
Plymouth Red Ash L. & W. C. Co.'s,					5	30	5	45	5	95	4	95	4	00
Honeybrook Lehigh Fulton Lehigh Scranton	8				5	45	5	45	5	80	5	00 00 80	4	00
Lackawanna														

We quote as follows: Anthracite, \$4.85 @ \$5.80; Cumberland, \$6.50@ \$7; West Virginia, \$6.75 @ \$7; James River Steam, \$6.25; James River Carbonite, \$9 @ \$9.50; Kanawha House, \$14.25; American Gas, \$7 @ \$8; American Cannel, \$12 @ \$14; Pennsylvania and Westmoreland, \$6.75; Murphy Run, \$6.50; Newburg Orrel, \$6.50; Sterling Ohio, \$10; Ince Hall, \$17 @ \$18; Liverpool House Cannel, \$17; Liverpool Gas, \$12; Newcastle Gas, \$7; Scotch, \$7.50

PHILADELPHIA.

PHILADELPHIA, July 6, 1875.

As usual at this period, trade is much interfered with by the national holiday and the absence of business men. The market is without any change, unless it be a rather firmer feeling among holders of Pig Iron, some of whom look forward to a better trade very shortly. The foundries are generally fairly busy, and some report orders for some time to come. The rolling mills, however, are generally idle for the greater part of this month, and hence the demand for Forge Irons will not be quite so active. Stocks of Pig Iron are not considered to be, by any means, large, and as t will be some weeks before the product of furnaces now blowing in can reach the market, present holders are naturally firmer in their views of the price they should get. The increase in American iron manufactures exported to England, and favorably received there, continues to exercise the press of that country, and the London Times lately concludes an article on the condition of the English iron trade with the following:

"The developments of the American Iron in dustries have, of late years, been both large and continuous. The American Iron market is no longer commanded by our exports, and our Iron trade must bestir itself if it desires still to command other markets, including the English, in which it has already found formid-

Many of our most intelligent furnace men look forward to this trade for American hardware, tools and agricultural implements as the most encouraging feature for trade here for Pig Metal in the near future, and far more desirable than an export trade in raw irons could be. Manufactured Irons are dull, as always at this season, aithough trade holds out as well as could be expected. The orders are light, but the usual July stoppage may stimulate demand, as no great stocks are understood to be on hand. Rails continue in moderate inquiry, and principally on better terms than formerly offered, so far as payments are concerned. Old e. Manufactured Irons are dull, as always at offered, so far as payments are concerned. Old are nominally unchanged.

Ralls are very quiet, and sales are made with Rails are very quiet, and sales are made with difficulty. Scrap is not so active, although rices for choice selections of No. 1 Wrought

re pretty firmly maintained. We quote: PIG METAL.-No. 1 Foundry, \$27; No. 2, 126 ; Gray Forge, \$24 to \$25. BARS .- 2.6c. to 2.7c.

RAILS .- \$48 to \$50. OLD RAILS.-\$26 to \$26.50.

SCRAP .- \$30 to \$33 for No. 1 Wrought, as to

The sales include, in addition to the ten ton s for foundries, which have been somewhat 500 tons to go west; and contracts for 12,000 ns more closing to-day; 1000 tons Old alls, \$27, half here; 600 tons Muck Bar, \$44, nd 300 tons Scrap at \$30, here.

PITTSBURGH, July 6, 1875.
PIG IRON.—Trade has been rather quiet during the past week, as it nearly always is about the 1st of July, when it is customary with any of the mills to stop for a few weeks to the stock and make repairs. About the only aportant feature worthy of notice is that the willook is not recognified as being as favorable for

they should, as is sometimes the case, manifest they should, as is sometimes the case, manifest a desire to contract for a three or four months supply, an advance would be almost unevitable, as stocks hereabouts are light, as is also the production, and the general position of the market is favorable to the sciling interest in consequence. It is very probable, however, that the mills will adhere to the hand-to-mouth policy, buy only as immediate necessities require, as it is not likely that the mills will be disposed to pursue a course the result of which would be almost certain to increase the cost of raw Iron. We repeat former

QUOTATIO	
No. 1 Foundry	\$27 @ \$954 mos
No. 2 Foundry	25 @ 25-4 mos
Gray Forge.	24 @ 25—4 mos
White and Mottled	22 (6, 23, 4 mos
Cold Blast charcoal	35 @ 40-4 mos
There have been but ver	
Forge above \$24, 4 mos.,	and \$23 @ \$23.25.

thracite is 2,440,324 tons.

The following are the circular prices fixed by the Coal companies which are represented by Frederick A. Potts, 110 Broadway, for delivery thring the month of July:

Shipped from Port Johnson, Elizabethport, Hoboken, Rondout, Trenton and Porth Amboy.

Manufactured Iron — The general position of the market remains much the same as noted in my last report, excepting that business continues to fall off, as it always does at this season of the year, and a number of the mils, as is the custom, have been stopped to take stock and make necessary repairs. Manufacturers nearly all agree in reporting that trade has been very all agree in reporting that trade has been very custom, have been stopped to take stock and make necessary repairs. Manufacturers nearly all agree in reporting that trade has been very unsatisfactory ever since they started up; not that there was a scarcity of business, but because of unremunerative rates. Some of them having specialties in which as yet there is little or no competition, have done well enough, but the Bar mills, it is claimed, have made but little if any money. Quotations may be given on a

the Bar mills, it is claimed, have made but little if any money. Quotations may be given on a basis of 2-25c. @ 2-30c., Western, and 2-35c. @ 2-40c., Eastern classification.

NAILS.—There is a continued falling off in demand. Some of the factories have been stopped, and there will be a general suspension within the next week or two. Stocks in hands of manufacturers here are not large, although they have been accumulating recently, and prices remain unchanged, \$3, 60 days, with the usual discount of two per cent, for eash. Trade in Horse and Mule Shoes is also quiet, and is likely to continue so until next month.

Scrap Iron.—There is little or no movement

SCRAP IRON. -There is little or no movement

month.

SCRAP IRON.—There is little or no movement in the Scrap trade, nor is it usual at this particular time; dealers do not expect to do much until after the mills have got through taking stock and completed repairs. No I Wrought unchanged at \$32 to \$33, 4 mos. Scrap has declined from \$3 to \$5 per ton since the ending of the lock-out, while Pig Iron, on the other hand, has advanced, although when the mills started up the former was higher, relatively, than the latter.

The first half of 1875 has passed, and it must be conceded that, as far at least as Pittsburgh is concerned, general business has been anything but satisfactory, either in manufacturing or mercantile circles; it was considerably short of what was generally expected. Many of our business men report that trade was worse here during the time under review than at any period since the panic, and it is also worthy of notice that there were numerous failures and suspensions; men who prior to the panic were considered as "good as gold," have been swept out of existence; they have not only gone down themselves but have dragged others with them. However, there is comfort in the fact that business is settling down on a more healthy and legitimate basis. Legitimate business is rising and will soon be at par, while overtrading, which has been the cause of all our troubles, is at a heavy discount.

The Pittsburgh Commercial of July 3, says:

ing, which has been the cause of all our troubles, is at a heavy discount.

The Pittsburgh Commercial of July 3, says:
The metal market has continued during this week substantially the same as at date of last report, and the price of standard Gray Forge Iron may be fairly quoted at \$24, 4 months. The volume of business is less than last week's sales, and it is not expected that there will be much, if any, increase before the latter part of the month, and it may remain dull until the mills get fairly started on the fall run. We are reported the following sales:

	BITUMINOUS COAL SMELTED FROM L. S. ORE.
200	tons low grade, neutral \$23.00-4 mos.
100	tons close gray, neutral 23:50-4 mos.
100) tons close torge 23:00-4 mos.
100	tons gray forge, neutral 24.00-4 mos.
100	tons gray forge 24'00-4 mas.
56	tons close silvery
50	tons No. 1 foundry 27:00-1 mos.
	CONNELLAVILLE COKE.
100	tons gray forge \$24.00-4 mos.
200	tons gray forge 24:00—4 mos.
	ALLEGHENY COKE.
100	tons gray forge \$25.00-4 mos.
	ANTHRACITE.
80	tons No. 1 foundry
-	toms and a roundary mitter

CHARCOAL, 44 tons No. 1 foundry, H. R..... BALTIMORE.

\$30°00—4 mos.

BOSTON.

BOSTON.

PITTSBURGH.

PITTSBURG

ing forwarded seven cars of small sizes direct to one dealer. The receipts this week and now billed on the way will aggregate over 1200 tons, the orders for which were placed about two months ago. Current rumor, however, attributes about 600 tons on consignment from mills. The market is quite steady at \$58 to \$60, the lowest price the cash basis. Common iron is listless and quotes nominally \$52 to \$56. We notice at the Boston & Albany 30 tons 3-16 Rods of New England make bill ad through to a Cleveland mill, a very singular shipment. Steel is quite dull, except for corriage makers' purposes, and in such qualities, more especially Tire Steel, a fair jobbing trade exists. We quote American Tool, 15c. to 15½c.; American Machinery, 9½c. to 10c.; do. Cast Tires, 8½c. to 12½c.; Sweet's Excelsior Tire, 7c. to 7½c.; English Tool, 16c. to 17c. Copper is very dull and firm. Speculators have lost all interest, and manufacturers are supplying their wants out of old metals. We quote 23%c. to 23c. for spot; New Sheathing, 30c.; Bolts and Bruziers, 31c.; Yellow Metal Bolts, 28c. to 29c. Lead is quiet and steady. We quote Domestic 6c.; Foreign. 6%c.; Antimony is in small demand at 12½c. to 12½c., gold, per pound; Sheet and Pipe Lead, 9½c., currency; Tin Lined Pipe, 16½c.; Bar Lead, 9½c., less usual trade or 10 per cent. discount. Spelter is having a steady business, with prices well maintained. We quote \$7.25, currency, 30 days, or \$7.15, currency, prompt cash. Silesian is quiet, quoting nominally \$730, gold. Tin is easy business being exceedingly slack. Plates are quiet. We quote Straits 20c.; Banca, 24½c.; Refined English, 19½c., gold, Places are active; we quote Charcoal I. C., \$9.50 to \$10; Coke, \$7.75 to \$8; and Terne at \$8.50 to \$11, gold.—Com. Bulletin.

LOUISVILLE.

Messrs. Geo. H. Hull & Co., under date of July 5, writes us as follows: The market for all grades of metal is dull, with a strong tendency to inside figures. The usual time, 4 mos., is allowed on the following quotations: HOT BLAST CHARCOAT

HOT BLAST CHARCOAL.	
No. 1 F'dry, from Hanging Rock Ores.	\$27.00 @ 28.00
11 9 11 16 11 10	25.00 @ 26.00
" 1 Mill, " " " "	23.00 @ 24.00
" 1 F'dry, from Alabama, Georgia	40 00 69 41 00
and Tennessee Ores	25.00 @ 26.00
" 2 F'dry, from Alabama, Georgia	** 00 (B) *** 00
and Tennessee Ores	24.00 @ 25.00
" i Mill, from Mabama, Georgia and	48 00 ((2) 40 00
Tennessee Ores	93.00 2 24.06
Tennessee Ores	40 00 00 44 00
HOT BLAST STONE COAL AND CO	KE.
No. 1 F'dry, from Hanging Rock Ores.	\$25.00 @ 26.00
11 9 11 11 11	24.00 @ 25.00
16 1 Mill. 14 15 15	23.00 @ 24.00
" 1 F'dry, from Alabama, Georgia	40 00 G 41 00
and Tennessee Ores	25.00 @ 26.00
" 2 F'dry, from Alabama, Georgia	ma an 40 an an
and Tennessee Ores	24.00 @ 25.00
" 1 Mill, from Alabama, Georgia and	
Tennessee Ores	23.00 @ 24.00
No. 1 F dry, from Missouri Ores	27.00 @ 28.00
46 9 44 44 65	26.00 @ 27.00
" 1 Mill, " " "	26.00 @ 27.00
COLD BLAST CHARCOAL	
Car Wheel from Hanging Rock Ores	35.00 @ 40.00
" Tennessee Ores	30.00 @ 33.00
4	
Ores	80.00 @ 32.00
Car Wheel from Kentucky Ores	28'00 @ 35'00
	49 00 0
ST. LOUIS.	
13 A 0 A30 C A130	

Messrs. Spooner & Collins, Iron commission agents, 409 North Third street, St. Louis, under date of July 2, report the Iron market as follows: Our market is still in a very quiet condition. Prices have not changed, and probably will not, they being already below cost of manufacture. Most of our mills and foundries have no stock on hand, and with an increase in demand we look for better prices. We quote as follows:

Mo. Stone Coal, No. 1 F'dry \$28.00 @ 29.00-4 mos.
" No. 2 F'dry, 26 00 @ 27 00-4 mos.
" No. 1 Mill 25'00 @ 26'00-4 mos.
" Charcoal, No. 1 F'dry 28'00 @ 29'00-4 mos.
" No. 2 F'dry 26'00 @ 27'00-4 mos.
" No. 1 Mill 25'00 @ 26'00-4 mos.
Tenn. Charcoal No. 1 F'dry., 28'00 @ 29'00-4 mos.
" No. 2 F'dry 26 0 @ 27 00-4 mos.
No. 2 F dry., 20 to (2) 21 00-4 mos.
H. R. " No. 1 F'dry 29 00 @ -4 mos.
H. R. " No. 2 F'dry 37'00
H. R. " No. 3 F'dry 26'00 @ -4 mos.
Massillon, No. 1 Foundry 36.00 @ 37.00-4 mos.
" B, No. 1 Foundry., 34'00 @ 36'00-4 mos.
" No. 2 Foundry 83 00 @ 34 00-4 mos.
Cold Blast Car Wheeel, Mo 37'00 @ 40'00-4 mos.
" Tenn. 35'00 @ 40'00-4 mos.
Tenn. 85.00 @ 40.00-4 mos.
ing Rock 53'00 @ 55'00-4 mos.
Mo. Charcoal Blooms 75.00 @ 85.00-4 mos.
No. 1 Wrought Scrap11/c. per lb.
Machinery Cost ti
Machinery Cast " 1c. "
Stove Plates%c. "

CINCINNATI.

Messrs. L. R. HULL & Co., under date of July 5, write us as follows: Pio Irox.—The present condition of the merket is not particupresent condition of the merket is not particularly active, and prices range about the same. Some improvement in demand will, without doubt, be realized during the next four weeks, but it is not generally expected that prices will be immediately affected in proportion.

HOT BLAST CHARCOAL.

raming and	ARE THEFT	war and	COM.	BUT OU GO	40 00	and G
Hand w	No.	2		26.00 @	27.00-	mos.
44 45	Fore	ze		24.00 @	25.00-	mos.
Virginia No.	1			27.00 @		mos.
is No.	2			25.00 @	-	mos.
14 For	ge			24.00 @	25.00-	
Tennessee N	0. 1				0 -	
16 F	orge			24.00 @	25.00 -	
Alabama No.	1				-	
Missouri No.	1			28.00 @	29.00-	
" No	9				27:00	
				E COAL.		
Missouri No.						
" For	ge			26:00 @	0 -	mos.
Ohio No. 1				\$5.00 @	28.00-	mos.
" Forge.					26.00	
Am. Scotch,	No. 1.			25 00 @	26.00-	mos.
	COLT	BT.A	ST CH	ARCOAL.		
Hanging Roc		-			40:00	6 mas
Missessel noc	a Car	W Hee	I di ru		40.00	
M.188Ouri	8.6	86			40.00	
Rentucky	4.5	44			40.00	
Missouri Kentucky Tennessee Georgia	86	6.5		00.00 0		
Georgia	46	5.6		90.00 (0	40.00	
Alabama	- 4 77			93.00 (0	40.00-	
Machinery at					35.00-	
Blooms					80.00	moe.
		. Hotelson on	-	10,000		

FOREIGN.

markably steady at London, smelters having bought affoat all that had been advised chartered to the midaffoat all that had been advised chartered to the middle of past month. In anticipation of a scarcity of furnace material, and as the stock of foreign Copper at Liverpool and Swanses on the 15th Instant was but 13,675 tons fine against 17,000 m 1874, and 23,000 in 1873, the position of the metal is, from a statistical point of view, a decidedly strong one. The market has been irregular here. We quote, deliverable at Havre: Chill Bars. 217-50; Common ditto, 216:50; Ingots, 227:50; English Tough Cake, 227, and Pure Corocoro Ore, 216. Havre has remained inactive, while a portion of the stock there has been sold here; some arrivals from the West Coast are announced from there. Marsellles has remained firm on the basis of 220 ingots. A fair demand for The has prevailed in the London market, great firmness being observable, which from there has spread to Holland, where the metal, however, tacks firmness. We have followed the improved feeling that has shown itself elsewhere, and can advise a slight rise, quoting Banca, deliverable at either Havre or Paris, 233; Straits. 220, and English at Havre or Rouen, 225. Marsellles is also firmer, Straits and Billiton at 215 frances; English, 225. Lead.—Quietness has been the prevailing feature which has everywhere characterized this metal, the markets, meanwhile, rulling in favor of purchasers. Quotations bave varied little during the week in our own (Paris) market, and we quote, unaltered, French here 56, and Spanish, deliverable at Havre, 55 francs. At Marsellles few orders are received; lead refining there is not much pushed at prevent, The quotation there is 51 to 51'50' francs. Roue, and the market remains firm. Little has transpired here, prices keeping generally steady; we quote silesian 64 to 65 francs he 100 kilos. A rise has taken place at Havre, where it is quoted 67 to 68. Nothing new at Marsellles. From is but feebly supported at Paris. At the South rates are better sustained, but in the Dordonge, where antiquated processes still prevail, something evidently will h

BELGIUM.

BEIGUM.

(Revue Universelle).

BRUSSELS, June 20, 1875.—Iron.—As the season advances the paralyzation in the Belgian Iron trade seems to deepen, and some iron masters entertain gloomy views respecting the future. We do not share these apprehensions in the least, for from all we can ascertain there are many inquiries, indications and prospects pointing to increased business in the future, notwithstanding the momentary dullness that surrounds us. But first of all our manufacturers must be prepared to lower prices still further so as to enable us to successfully compete with the English and Germans at home and abroad. At the same time we ought not to be too sanguine as to our ability in the future to sell Belgian Iron in England. While the Welsh strike lasted we have, it is true, sent them 10,000 tons, but in the long run it will not be an easy matter to compete with and undersell our powerful rivals across the channel. For the moment, for instance, freights between Antwerp and England are too high. Coal has declined among us to a low figure, but wages are still too high, and it seems imperative that something should be done to reduce them to a point where our Iron industry can take a fresh start. Coal.—In the Liege district prices have been lowered sufficiently to enable Paris Coal dealers to purchase cheaper there than in the north or center of France. At Mons and elsewhere in Belgium stocks accumulate and stand very much in need of a revival in Iron industry. A strike in the Borinage region is reported from Charleroi; wages were to be lowered 10 per cent.

GERMANY.

GERMANY.

(Borsenhalle.)

HAMBURG, June 19. 1875.—Metals.—The extensive London failures have, of course, made a bad impression in commercial circles here, but without materially affecting values in any one branch of trade, the causes which have brought them about being well known, bound up as they are with the excessive bill credit system of that city with distant countries, never carried to such lengths on the continent. Metals have probably been less influenced, directly or indirectly, on the continent than any other class of commodities. Copper.—The German markets have, from dullness in the metal, been rather weak; still Stettin remains steady at 96 to 100 marks. Here we have not changed from the quotation of 94 marks for Drontheim, and 100 Lake Superior. This has remained unextied; our markets do not heed the passing improvement in England and Holland. No amelioration can be expected in Germany as long as the metal remains situated as it is. We quote Banca here 101 to 103 marks. English Common 100 to 102, and refined 101 to 102. Lead.—While the improvement was going on in other parts of Europe, sometime ago, it was not an easy matter to get our markets to follow suit, and they are remarkably flat now, if we except Stettin, sustaining the figure 26 to 27 marks for Spanish, and 24 to 25 German. We are quiet here at the following quotations: German, 23 725 to 24; English Pig. 25 50 to 26; and Spanish 26 to 25 50. Speller.—Consumption in Europe having outrun production, the supply has become so scanty, both on the continent and in England, that great firmness prevails. The stock at Stettin is pretty much exhausted, and the quotation of 24 to 25 marks upheld. Breslau is firm, little offering. Here the supply has been reduced to a mere trifle, and we quote nominally 24 50.

Hanging Rock No. 1. 39 ton. \$28.00 @ 29.00 -4 mos.

(Koch & Vierboom.)

ROTTERDAM, June 19, 1875.—Tin—The market remains firm, but the dealings are insignificant; there is not much offering, but, on the other hand, buyers are not anxious to operate. Some triding lots Banca have been taken for the covering of short salies at 5034 to 51 guilders. No spot Billiton is offering at present.

AFRICA.

AFRICA.

(Cape Town Journal.)

CAPE Town (Cape of Good Hope), May 1, 1875.—
Copper.—The output of the Cape Cepper Mining Co.
for the four months ending yesterday has been 3745
tons of Ore, against 2843 in 1874. This shows the
steady increase in the yield of the company's mines,
which is now at the rate of 1990 tons per month.
The ore is now, with new machinery, dressed to the
extent of 1060 tons monthly, of which the heretofore
non-productive surface reserve contributes 100 tons
a month. The Copper deposits are rich, and the
opinion is expressed that their value in the future
will quite throw into the shade that of the gold and
diamond fields in other parts of the colony.

duction is as yet quite primitive, but it will not last long, and Californians will. In all likelihood, be out the spot and assist in developing the property, which, considering the enormous consumption of Quickeliver in our Silver mines, promises to become of the namost importance to Mexico.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

SHEFFIELD, ENG., June 21, 1875. FURTHER HEAVY FAILURES.

Another "commercial crisis" has taken place, and has been duly, fully and particularly chronicled by the newspapers throughout the kingdom, as also, doubtless, on your side of the water. The first firm to come down was that of Messrs. Collie & Co., of London and Manchester, commission merchants, with liabilities estimated at about £3,000,000 sterling. This firm collapsed on Wednesday, since which some ten or twelve others have shared the same fate, many of them owing to the fact that they had been unlucky enough to hold the acceptances of Collie & Co. to a large extent. Young, Borthwick & Co., Fowlie & Co., Anderson & Co., J. P. Westherd & Co., and others are in this category. The stoppage of Robert Benson & Co., the well known American merchants, is likely to be of more than common interest to some of your readers. The firm had been long established, and it had an exceedingly large and valuable business connection. Its credit had, however, recently been impaired by the failure of Mr. Fothergill's Plymouth and Aberdare concerns, and this becom ing known to the bankers and discounters, made it so difficult to obtain the usual facilities that the ground was, metaphorically speaking, cut from under the feet of the luckless partners, and they had ultimately to stop. Their liabilities are fully a million, and possibly greatly in excess of that large sum. Two of the partners, however, are exceedingly well connected, so that a respectable compromise may be forth-coming in respect of those liabilities which do not run off. I consider it highly probable that several other great failures will take place either this afternoon or between the 25th and 29th of June. In view of the great interest attaching to the subject, I snnex a

LIST OF RECENT FAILURES, all of which have taken place within the past month, and do not include that of Tiden, Nordenfelt & Co., for over £4,000,000, which took

place shortly before:

Name, &c. Liabilities.
J. C. im Thurn & Co., import merchants,
London.
Siordet & Co., general merchants, Mark
lane (of which £300,000 is likely to run
off). 200,000

off).

General South American Company.
Hay, Ingram & Co., London and Kangoon
Wilson, M'Ley & Co., merchants, Glasgow
J. Morison & Co., shipowners and salicloth manufacturers, London.
T. Richardson & Sons, engineers and ironfounders, London and Middleton, near
Hartlepol.
J. H. & A. Bell, export merchants, Dundee. dee
H. Emmens Brothers, merchants and bankers, London
James Taylor, shipowner, &c., London and Middlesborough
Wilkinson, Watt & Co., steamship owners, London 100,000 140,000 253,000 109,000 5,000,000London.... Sanderson & Co., bill brokers, London.... J. Dawbarn, coal and iron merchant, Lon-

600,000 1,300,000 3,600,000

84,000 20J,000

140,000

25 .000 Wilson & Armstrong, woolen merchante, London.... London... Rainbow, Holberton & Co., London... Benson & Co., bill brokers, London... Malcolm, Hudson & Co., financial agents, 200,000 180,000

RUSSIA.

(Journal de St. Petersburg.)

St. Petersburg.)

St. Petersburg. June 7, 1875.—The government has again displayed great activity and enterprise in guaranteeing the interest on new lines of railroad, in this way, aside from the large amounts of money which it will have to disburse on the newly projected lines, which are the following: A line to connect the Caspian with the Black Sea, and the Donetz coal district, with the plains of the Dnieper, to be immediately taken in hand. the great Siberian railroad, which is to connect Nijni-Nowgorod, Kasan and Jekaterinenburg.

HOLLAND.

(Koch & Vilerbow losses a first of the Dnieper, to be immediately taken in hand. the great Siberian railroad, which is to connect Nijni-Nowgorod, Kasan and Jekaterinenburg. have brought about not a few of these disasters. have brought about not a few of these disasters. It is, indeed, evident that when a number of firms either "accommodate" each other by backing paper without any proportionate or equivalent advantage to themselves, or by holding their mutual acceptance, as soon as one collapses the others must needs topple over, like ninepins. The fact is, or appears to be, that shipment of goods have been made to the Eastern and South American markets purely as speculations (those markets being already full to repletion), which have, necessarily, resulted in heavy losses. The evil day has been staved off as long as possible, but it has at length in heavy losses. The evil day has been staved off as long as possible, but it has at length come with a vengeance. Legitimate traders will, of course, be benefited—if they can stand the temporary pressure—and business will afterward be conducted on a much safer

THE SHEFFIELD-AMERICAN TRADE.

A number of pens are weekly and weakly employed by the Sheffield and Rotherham (principally Rotherham) Independent in the production of a column or so of peculiar composition, which is duly set forth to the admiring gaze of FRANCE.

(Monitaur des Interest Materiels.)

Pans, June 20, 1875.—Metals.—Some additional failures have taken place at London, the Habilities being unusually large in a few instances. Fortunately the Bank of England is well fortified, and money generally easy, speculation has not been active in metals for some time past, nor can prices be called high, hence the effect of these suspensions has not been hereeffect of these suspensions has not been hereeffect of these suspensions has not been perceptible so far as values are concerned, but the determination on the part of the trade to keep within safe bounds has become strengthened, and business will be strictly confined to filling immediate consumptive wants till confidence recovers from the shock it has received, and no more important fails urse occur. The system of buying goods in the target and drawing six months' sight against them, seems to merchandise from remote countries at the risk of heavy losses, and as the discount banks have readily lent themselves to fostering this sort of trade, by taking the drafts, a good many disasters now occur, one failure involving another. Copper.—Charters on the West Coast for the fore half of June have not exceeded 1700 tons, and quotations have remained re-

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has not become so exhausted that there are none left to stand in the shoes of their ancestors!!" Do I anticipate your laughter? "Until other markets, etc., tempt her merchants away!!!" I will not say that I suspect the Sheffield Independent of joking—such a suspicion could not for a moment be entertained. The paper is, at any rate, free from any imputation of that character. Funniness cannot be laid to its charge. What, then, is the meaning of this allusion? It is not even logical. If "other markets" offer greater inducements why not cultivate and develop them? If they do not, as the Independent itself involuntarily proves, then perforce the struggle for the United States connection must be, and, necessarily, is being prolonged. Oh, what a dreadful thing it is to have a too candid friend! [Exit Sheffield Independent.]

THE SCOTCH PIG IRON MARKET.

The Glasgow warrant market has been fairly The Glasgow warrant market has been fairly steady during the week just ended, prices having been confined within the limits bounded in either direction by 55/and 59/3 respectively. At the termination of the week's business a firmer tone had become manifest, and this morning's telegram informs me that a steady, although small, turnover is being effected. The transactions in mikers' from have been on a tolerably wide basis, if we may take the shipments (11,625 tons as against 5483 in the corresponding week of last year) as any criterion, ments (i1,625 tons as against 5483 in the corresponding week of last year) as any criterion, and prices appear to be clearly steadier. There are now 122 furnaces blowing it Scotland out of 157. The stock held in Connal's warehouses is at present 36,358, nearly 2000 tons more that at the same period last year, when only 68 furnaces were in blast. Ballast pg iron is 52/per ton, transatlantic freights being unchanged.

Writing from Glasgow on June 18, Messrs. James Watson & Co. said; "The market for Scotch pig iron has been steady during this week, warrants fluctuating between 58/and59/, cash, closing firm at the latter figure. Shipments last week were 11,625 tons, against 5483 tons in the corresponding week of 1874."

No. 1. No. 3.

													No. 1.	No.
Q. M. B., at	Glasgow	٠.		,				0		0			61/	59
Gartaherrie,	6.0									,	 		65/6	61
Coltness,	46												67/6	63
Summerlee,	46												65/6	61
Langloan,	6.9										 		64/6	61
Carnbroe.	64									0	 		63/6	61
Calder, at Po	rt Dunda	8											65/6	61
Glengarnock													67/6	61
Eginton,	6.0												59/6	58
Dalmetlingto	m. cs												59/6	58
Shotts, at Le											 		65/	63
Kinneil at B													61/6	58
Messra V	Vm. Col	vi	n		A	2	1	C	0	ĺ	(1	G	lasgow.	Jun

Messrs. Wm. Colvin & Co. (Glasgow, June 23d) say: "The warrant market was slightly influenced by the heavy failures reported on Wednesday morning, and the opening price on that day was 58/, from which it promptly ralled to 58/6, and fluctuated on Thursday and Friday between 59/3 and 58/9. This week a firmer tone has been manifested; yesterday business was cone from 59/ to 59/10½, and to-day from 59/9 to 59/3, closing with sellers at 59/3, and buyers 59/. There is an improved demand for shipping iron, and both makers and dealers are firmer in their prices. We subjein our usual quotations."

				De	div	erable alo	ngside.
						No. 1.	No. 3.
G. M. B., at Glass	ow					. 61/6	60/
Gartsherrie "							61/6
Coltness. 65						. 68/6	61/
Summerlee, "						. 65/6	61/
Langlosn. "						. 66/	61/
Carnbroe. "						. 63/	61/
Monkland "							60/
Clyde							60/
Goven, at Broomi							61/
Calder, at Port De	andas					. 67/	63/8
Glengarnock, at A							61/6
Eglinton, "							59/
Dalmellington,"							59/
Carron, at Grange	mont						-
Shotts, at Leith							68/
Kinneil, at Bo'nes							59/6
Bar Iron							
Nail Rods							201 201
	91	HPM	EN	TB.			
							Tons.
Week ending Jun	e 19.	187	5				

Increase Total increase for 1 Messrs. John prices current are	878 E. 8					5,648 58,179 Ited),
Glasgow Brands.	rbaces ring, 122	out 35.	rnaces tilt, 157.		Prices.	
	Fu B'v	Fu	Fan	No. 1.	No. 3.	No. 4
Gartsherrie	13	3	16	65/	60/6	62/6
Coltness	19	0 2	12	67/	69/6	***
Summerlee	6	2	8	65/	61/	62/
Langloan	4	1	5	63.6	61/	63/
Govan	4	1	5	60/	59/	62/.
Calder	6	2	8	*66/	61/	62/6
Shotts Bess'mer Ordinary	5	2	7 }	85/ 65/	63/	62/
Carnbroe	4	2	6	62/6	60/	64/

* f. o. b. Glasgow, 1/ per ton, extra

Carron | Selct'd | Ordn'y

Glasgow Warrants, 3-5 No. 1; 2-5 No. 8, g. m. b. WEST COAST BRANDS-t. o. b. Ardrossan.

60/ 59/

Kinneil	3	1	4	60/	59/	59/6
EAST COAST BE	AND	-f.	o. b.	in the .	Forth.	
Portland \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	6	2	6	50/	58/	58/
Mulrkirk	4 8	0	4 3	60/	58/	59/
Ardeer	7.6	1 0	51	67/	61/	62/

CARPET MANUFACTURERS AND THE CENTENNIAL. I mentioned in one of my recent letters that the English makers of Brussels carpet were

the English makers of Brussels carpet were generally declining to exhibit at Philadelphia. A menorial has since been signed by twenty-nine tirms (representing four-fifths of the trade) in the following terms: "To his Grace the Duke of Richmond, K. G., Lord President of the Council and Commis-sioner for England, Philadelphia Exhibition, 1876.

May it please your Grace .-"We, the undersigned carpet manufacturers of Kidderminster and neighborhood, beg leave to submit the following reply to the circular issued by your Grace, inviting us severally to contribute specimens of our various manufactures to the Philadelphia International Exhibition, 1876.

tion, 1876.

"That in view of the heavy duties now levied by United States on the importation of carpets produced in this country—an additional 10 per cent. Laving recently been reimposed—the manufacturers fail to see any advantage in which it is a second or the second of the secon responding to the invitations requesting them to become exhibitors in Philadelphia in 1876;

THE METAL MARKETS the been quiet during the week, in spite of the very stormy character of the commercial atmosphere in the earlier part thereof. Copper may be remained dull and inanimate, but there in the earlier part thereof. and they respectfully submit that international exhibitions are incompatible with tariffs of a probibitory character,

"We further desire that your Grace will be pleased to cause representations of these reasons, and a copy of this resolution, coming from an important branch of English manufac-turing industry, to be laid before the American

Commissioners.

"We have the honor to be, your Grace's obedient humble servants."

I notice, also that M. Herman La Chapelle, one of the principal engine builders of Paris, has addressed a long communication to the Moniteur Industriel Belge, pointing out that it is useless for French manufacturers to exhibit.

TRADES OF SHEFFIELD.

Trade remains in a quiet condition, and is, apparently, likely to remain so until a reduction in the price of fuel, or some further lower-Trade remains in a quiet condition, and is, apparently, likely to remain so until a reduction in the price of fuel, or some further lowering of wages, enables the producers of fluished from and steel to meet the wishes of their customers in the matter of prices. Pig from has been a couple of shillings or so weaker since the decline is Scotch values set in, but I am unable to gather that the local demand has been greatly stimulated thereby, the few sales on record having been of good foundry or the best forge numbers in small lots, varying from 100 to 750 tons. The following quotations for the hematite pig from slargely used in the Bessemer steel works in this district are those of producers, but are of a somewhat nominal character, large buyers, if such there be at the present juncture, being atla to shade these figure somewhat materially: Maryport hematite, No. 3, 82; No. 4, 81/6; No. 5, M. and W., 80 to 81/5 per ton; Bessemer, No. 1, 85/; No. 2, 82; and No. 3, 81/ to 82, all less the customary 2½ for prompt cash; Millom Bessemer, No. 1, 87/6 to 89/; No. 2, 86/ to 87/6; and No. 3, 84/ to 85/; ordinary No. 3, 84; No. 4, 83/; No. 7, 83/; No. 8, 87/6 to 89/; W., 93/; and white, 88/ to 90/ per ton on four months terms. Ordinary merchaut iron is quiet, and is not being largely sold. Common bars in large lots are obtainable at 28 to 28, 2/6, but really reliable bars are not to be had under 29 to 29, 10/, and the superior irons of this class are quoted at 211, 10/ to 212, 10/. Sheets are 214 to 214, 10/, and hoops 211 to 211, 10/. The bars and plates of the Bowling, Low Moor, Kirkstall and Butterly companies are in good request for special purposes, and are unflinchingly maintained in prices. The armor plate departments con inne to be steadily and fully employed on large sized plates for British, Italian, German and Brasilian vessely, as also on shields for our own and various foreign forts and fortifications. These departments have long been fully occupied, and it is shrewdly suspected that they have been of great s

Rails are being turned out in rather large quantities by several establishments. The Atias Works—John Brown & Co., Limited—are, I notice, sending off consignments by the canaito Hull, whence the rails will doubtless be shipped to their destination.

There is a clearly upward movement in several branches of the cast steel trade, owing, so far as I am able to ascertain, to the renewal of American favors for best and "special" tool steel, plow and saw pistes, axe steel and wire. It is also stated that two or three of the home railway companies have renewed their contracts with good local houses, and have initiated the re-engagements by giving out orders of respectable size for spring and miscellaneous steel.

Of late a very well sustained and at times pressing demand has been experienced for both from and steel wire. The former, galvanized, has been in request for telegraphic purposes, fencing, &c., and the tougher, as well as lighter, steel strands are still bought for colliery winding ropes and steam plowing tackle, where much strength is absolutely necessary. Several new works, or extensions of existing establish.

much strength is absolutely necessary. Several new works, or extensions of existing establish-ments, have been erected in order to supply

share holders on Wednesday morning. The balance sheet shows the net profits available for dividend to be £79,128, out of which a division at the rate of £6 per share (£90 paid up) is proposed, leaving £10,000 to the reserve fund, and £9128 forward. The directors remark that the past year has been one of a very anxious and disquicting character in the iron and steel trades generally; and profits have been diminished by the great and sudden reductions in the value of material and the extreme competition consequent on the undue inflation of trade during the two preceding years. The company has also sustained an exceptional and very considerable loss in connection with two heavy contracts with an American railway company, the whole of which has been charged against the revenue of the year. All the buildings, machinery and working plant have been maintained out of revenue, and are throughout in excellent condition. The collieries have proved a valuable additions have been made to the plant, including a large Guiball's fan and a new pumping shaft. The capital of the company, it may be remarked, is £1,000,000 in 10,000 £100 shares, of which £90 each are paid up. The properties owned and worked by it are Cyclops Steel and Iron Works, Sheffield; Grimesthorpe Steel Works, Penistone, and the Oaks Coliteries, near Barnsley.

In entiry there is no movement of any im-

Barnsley.
In cutiery there is no movement of any importance, most of the best houses having plenty of orders, and firms of lower standing having

It has been decided to carry on the Plymouth and Abernaut Works for the present, and Mr. Fothergill, M. P., is said to have arrived in the district for the purpose of superintending the relighting of the furnaces, &c. Cyrfarthfa is growing a little busier, as also are Rhymney, Briton Ferry, Landore and Tredegar, but it is, as I have previously remarked, as yet practically impossible for the iron trade to become brisk. Dowlais is very well engaged on an exceptionally good order for rails, together with smaller commissions for bars. The tin plate works are tolerably well engaged.

Messrs. Von Dadelszen & North say: "The metal market has been quiet during the past week, and prices have been well maintained, though the business done has been unimportant. The disastrous failures which have been reported during the week have had no direct effect upon metals, for beyond that some of the suspended firms were occasional buyers in reported during the week have had no direct effect upon metals, for beyond that some of the suspended firms were occasional buyers in our market for shipment to the East, the metal trade in itself was wholly unconnected with them. The bank rate remains at 3½ per cent. Iron.—We have no changeto report either from Wales or Staffordshire, and prices are almost nominal. Scotch pigs have oscillated between 58/and 59/c closing at 58/6. The shipments last week were 11,625 toos, against 5483 tons for corresponding week 1874. Copper.—Very little business reported. Chila bars sold to a small extent at £82.10/for G. O. B., and £83 for named brands. Wallaroo, £90.10/, nominally f. o. b., and asmall lot of Burra sold at £87, 10/in warehouse. English steady, £93, for India sheets. The Chili charters for first fourteen days of June are telegraphed as 1700 tons. Tin.—Straits has been purchased to a fair extent at £84 to £84.10/, both on the spot, to arrive, and for forward delivery. Australian has been sold at £28 to £82.10/. Banca is held for 50/4fl., and Billiton for 48/4fl. The Billiton sale in Java went at an average of \$53.08 per picul, equal to about \$2/per cwt. in Holland. English tin is very quiet, and nominally £91 for common ingots. Tin piates are much depressed, and to effect sales very low prices must be submitted to. Lead, duil. Good soft English, £22.5/to 22.10/; L. B., £22.7/6; soft Span'sh, £22. Spelter.—There are sellers of Silosian at £24, but no business reported. Quieksilver remains at £12."

Messrs, Vivian, Bond & Watson's circular states: The Copper market for the past forting thas been quiet, and there is little or no change in values of Chili bars. The sales have been very moderate at £82 to £83 per ton. Three cargoes of Chili regulus have been taken by the smelters at 17/to 17/1½4, and a cargo of Bolivian ore and regulus at 16/6 for ore and 17/for regulus, all for distant arrival. The charters for second half of May are advised at 1900 tons fine copper, namely, 600 tons bars, and 500 tons free copper, the suspended firms were occasional buyers in

closes firmer at £84 to £84. 10/. Small sales of Peruvian at £74 per ton."

Messrs. Berger, Spence & Co. say: "The great Aberdare disaster, and its greater consequences have, so far, proved but mild mementoes to the iron trade. They have afforded it all the experience a crisis can yield, without any of the rude inflictions with which wholesome lessons are as a rule administered. This remarkable immunity may in some measure be accidental, or perhaps our inference premature: remarkable immunity may in some measure be accidental, or perhaps our inference premature; there is, however, reason to hope that, in our district, at least, the iron industry will tide over the difficulty with its proverbial soundness unimpaired. It certainly seems singular that a catastrophe which has admittedly originated in the iron trade, and already affected the most distant links in the commercial chain, should have been so slightly felt where its sway would have appeared most natural. We think we may safely view this phenomenon as a promise of distant tiers in the continents of the course of all other markets, sharing, per haps, as much as any in the general uneasiness, but there has, nevertheless, been some doing, especially in Scotch brands, which have evinced rather more firmness of late. Some of the leading makers appear to have made a bold stand against reducing their prices any further, a resolve they are sure to be supported in by all, including English producers, whose firmness has hitherto availed little against the growing numbers of undersellers. In copper a few unimportant transactions were concuded during the early part of the week, but latterly no bustments, have been erected in order to supply these new requirements.

The coal trade is quiet, but it cannot be said that prices are falling in the same ratio as the demand. There is very little doung in household qualities, but a tolerable tonnage of steam and gas coal is being shipped, foreign and coastwise, from the Humber ports.

The annual report of the directors of Charles Cammell & Co., Limited—a concern second only to that of John Brown & Co.—was issued to the share holders on Wednesday morning. The balance sheet shows the net profits available for dividend to be £79,128, out of which a division at the rate of £6 per share (£60 paid up) is pro-

On the 4th instant, telegrams were received from Vaiparaiso, advising charters for the second fortnight of May as 1900 tons fine copper, consisting of 600 tons bars and ingots, and 500 tons ore and regulus for Englard, and 800 tons bars for the continent. Hardly any variation has taken place in the price of bars, which have been remarkably steady during the fortners. In contance, most toportance, and firms or just enough to keep them gone, of orders, and firms or just enough to keep them gone.

There is a great quietude in these localities, the recent great failures having rendered both merchants and manufacturers uncommonly careful of their respective transactions. The United States market appears to be gradually fading out of remembrance, and the hardware manufacturers of these dietricts have almost ceased to entertain that "hope deferred," which, long cherished, never brought about any hich, long cherished, never brought about any real revival of business with America. They, real revival of business with America. They push their wares into other markets. Prices of protection," and are rejuctantly compelled to push their wares into other markets. Prices of all kinds of iron and leading lines of hardwares, &c., are nominally unaltered.

The has been decided to carry on the Plymouth wares, &c., are nominally unaltered.

The has been decided to carry on the Plymouth and Works for the present, and Mr.

The has been decided to carry on the Plymouth and the standard advanced £2, 2 % per ton. Stock of Chill copper all tast in the fast of the protection of the standard advanced £2, 2 % per ton. Stock of Chill copper all tast in the fast of the protection of the standard advanced £2, 2 % per ton. Stock of Chill copper all tast in the fast of the protection of the protection of the standard advanced £2, 2 % per ton. Stock of Chill copper all tast in the fast of the protection of the standard advanced £2, 2 % per ton. Stock of Chill copper all tast in the fast of the protection of the standard advanced £2, 2 % per ton. Stock of Chill copper all tast in the fast of the protection of the standard advanced £2, 2 % per ton. Stock of Chill copper in Harre, 1087 ton. Stock of Chill copper all tast in the fast of the protection of the standard advanced £2, 2 % per ton. Stock of Chill copper all tast in the fast of the protection of the protection of the protection of the protection of the partially lost, and we quote £34 for Straits, £82. 10/for Au-tralian, £70 to £74 for Peruvian, and £91 for British. Lead.—Market inactive, at £22. 10/for ordinary shipping brands. Spelter.—Market devoid of animation, at £24. 5/for ordinary Stiesian brands."

There was a large crowd present to witness 5 cwt.

the affair and everything passed off smoothly. Her dimensions are: Length over a'l, 290 feet length from stem to inner stern post, 275 feet breadth of beam, 38 feet; depth of hold, from base line to top of spar deck, 22 feet 9 inches. Her machinery will consist of one inverted direct acting, surface condensing propeller engine, with a diameter of cylinder of 50 inches and a stroke of 60 inches. Her propeller will have a diameter of 13 feet and a pitch of 21 feet, the four blades being bolted on a spherical hub. The Brashear will be schooner rigged fore and aft, and has a burden of 2250 tone, and will have a capacity for carrying 4800 bales of cotton on a mean draft of 91/4 feet with 250 tons of coal sufficient for fourteen days' full steaming.

The Pennsylvania Copper Industry.

The Philadelphia North American says: Cop per was known and wrought before iron and the most ancient discoveries we have in this country show that an unknown race mined it here. The metal is found in Great Britain Norway, Sweden, Austria, Germany, Italy, Turkey, Spain, Africa, China, Japan, Australia; and on this continent, in Cuba, South and Central America, Mexico, Canada, as well as in the United States. Our principal deposits are in the Lake Superior region; but copper is found in Pennsylvania, Virginia, Tennessee North Carolina, Georgia, Maryland and New England, and this country contributed its full share toward doubling the world's product from 25,500 tons in the quarter of a century after 1830. The increase is steadily augment ing to meet an ever augmenting demand from former uses and from new; and now the enor mous smelting works that have given commerce, wealth and renown to Swansen, in South Wales, are being copied by less but flourishing ones in Baltimore, Boston, New York St. Louis and in this State. Those here have the advantage of being near to the raw ore, and thus saving transportation; and the Chemical Copper Company, recently founded at Phœnixville, contiguous to the Schuylkill Works that are some three years old, have a material aid in the Hunt and Douglass process that has been successfully tried by the Ore Knob mine in North Carolina, The Schuvlkill Works that were burned a year ago, produced 109,-675 pounds of ingot copper, almost exclusively from Pennsylvania ores, in the six months preceding their destruction. It is the only establishment in the State reducing direct from the ores, and has a weekly capacity for turning out 15,000 pounds of ingot. The merit of the product is shown in the fact that it nets five cents per pound more to the company in Liverpool than in Philadelphia, after paying all charges for transportation.

Chemical Company located near the Schuylkill have two large buildings and good machinery. They accomplish the reduction of the crude ore by a chemical process, with salt and iron, in a single furnace, much more cheaply than it can be done by smelting. They have leased a fine deposit of copper recently struck in York County; obtain other ore from Montgomery, Berks and Lebanon counties and draw a part of their supplies from Texas, Cuba, New Mexico, Spain and Missouri -the Texan yielding up to 60 per cent., while much of the Pennsylvania ore will not give over 5 per cent. The process requires a preliminary roasting; roasting to blue metal; then to white, to blister and refining, when it is cast into ingots and sold at from twenty to thirty cents per pound. The com pany employ fifty men in their own mines, and last year sold 15,000 pounds in the Mint. The condition of the market and the superiority of the process employed warrant a sanguine belief that before long these smelting works will interfere with the exportation hence to Swapsea, draw from Central and South America, and create another industrial avocation tha is not only kindred to that of iron, but relate to lead and nickel and zinc, and emmently suit able for a community that possesses peculiar knowledge and resources of all kinds fo equaling any in every branch of metallurgy The new enterprise is based upon knowledg and experience; has skill and capital at it command, and not only promises success to it promoters, but enlargements that must be ver valuable to the country.

To Color Copper Alloys and Silver as Intense Black .- Paul Weiskoff, of Morger stern, recommends the use of chloride of platinum which has deliquesced in the air for imparting a permanent black color to copper alloys, like brass, pinchbeck, bell metal, gun metal, etc., as also to silver alloyed with copper. The mechanical manipulations are most easily performed in this way: The workman moistens the ball of the thumb slightly with loops by which it can be hung up against the wall as the liquid and rubs the article to be blackened with it strongly. The article at once becomes covered with a black film, which can afterward be washed and polished with a polishing leather and oil. So little of the chloride of platinum is consumed that, notwithstanding its high price, the process is a comparatively economical one, especially on account of the simplicity and rapidity with which it can be applied. This same property which platinum has of precipitating itself as a black film on the surface of other metals, notably silver, causes it to be of their getting out of order, unless the cords, which quite extensively employed in photography for blackening the silver deposits on negatives and transparencies.

There has been constructed recently, at the extensive iron works of Messrs. Carter & Allen, The iron steamship Brashear, the ploneer in Tamaqua, Pa., a monster cast iron drum for of the Harlan & Hollingsworth Company. drum 12 feet; weight of each segment, 2 tens

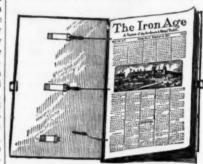
The Ohio City Nail Mill, at Martin's Ferry. Ohio, is about to introduce an ore pulverize four additional puddling furnaces, one additional heating furnace, and ten new nail machines, as their present capacity is entirely in-adequate to supply the demand. The new office and warehouse are rapidly approaching completion.

London Metal Market.

(From The Mining Journal.)

7	Copper-V ton. L.	8.	d.	Æ.	8.	d.
9	Best Selected. 90 Tough Cake & Tile. 90 Sheathing and Sheets. 94 Bolts. 90	0	0	04		
n	Sheathing and Sheets 94	0	0	94	0	0
		0	0	96	0	9
9	Old. 80 Australian, Wallaroo. 90 "other brands. 88	0		88	0	0
	Australian, Wallaroo 90	10	0	91	0	0
	Chil bars, g. o. b 82	10	0	88	10	0
	Chil bars, g. o b 82 Wire	0	11%		-	
	Bross & D	3	03%		1000	
	Brass-w h. Sheets 0	0	9	0	0	10
	Tubes 0	0	934	0	0	0
1	Wire 0 Tubes 0 Yellow Metal Sheathing 0	0	934	0	0	11%
В	Bheets U	0	736	0	0	0
	Foreign on the spot 24	10	0	-		
t	" to arrive 24	0	U	energy.		
9	Zinc-* ton.	10	()	000		
9	Outch suver - W bottle, 12	0	0	30	0	
,	Quicksiver—# bottle, 12 Tin—# ton. English Blocks 9 Ditto Bars (in bris.) 91					
	English Blocks 9	0	0	0	0	0
1	Ditto Refined 99	0	0	ő	ő	0
ì	Ditto Refined	0	0		-	9
a	Australian 84	10	0	0	0	0
8	Straits Stra	40				
,	IC Charcoai1 qual. 1		0	1 2	18	0
,	IC "2 qual. 1		0	î	12	0
7	IX " qual. 1		0	1	16	0
	IC Coke	10	0	1	18	0
t	Canada Plates W ton. 17	0	0	1.8	0	ő
	at works 16	0	0	17	0	0
	Bars Weisn, in London 8	7	6		_	
-	to arrive 8	6	0	8	7	6
1	Nail Rods	10	0		Distr.	
	Bare 9	10	0	10	10	0
	Hoods	10	0	11	10	0
•	Hoops ditto	10	ä	11	10	ő
)	Sheets, single, and plates 12	0	9	14	10	6
t	Pig. No. 1, in Waies 3 Refined metal ditto 7	0	0	6	10	0
	Bars, common ditto 7	15	0	8	0	0
	Do, merchant. Type or feer 8	10		8	5	0
	Bars, common ditto	0	ő	_	U	0
1		0	0	-	0	0
Ц	Pig. No. 1, in Clyde 3	15	0	8	10	0
.	Ditto. Nos. 8. 4. f.o.b 8	18	0	2	1.5	0
1	Railway Chairs 4	0	0	18	10	0
П	Railway Chairs	Ö	ö	10	Ü	0
ч	Steel-Pton.					
	Swedish, in kegs (rolled) Ditto (hammered) 19	10	0	20	0	0
٠	Ditto, in faggots 20	0	0	-		
. 1	English, spring 18	0	0	22	0	0
1	English spring	10	0	_	0	
1	Ditto, LB	35	0		no	M3.
1	Ditto Sheet	10	0		0	0
: 1	Ditto. Red Lead 34	10	0	_	0	0
. 1	Ditto, White	0	0	82	0	U
	Spanish. 22	0	0		-	0
1	Spanish	er ton	less.	Ter	ne pl	
1	28. per box below tin plates of 8	mua	r bran	us.		
	rasad on, tor choir as.					

Get Binders FOR THE IRON AGE.



We have made arrangements to furnish Kocn's PATENT BINDER, which we think altogether the best before the public, to our subscribers at the following very low rates-about the wholesale prices by the

t	dozen.	
đ	Half Cloth \$1.00	08
t-	(Cloth Back and Corners, with Mo-	
er F	rocco Paper Sides—a good, ser-	
7.	viceable Binder.)	
e	Full Cloth 150	
8	(Morocco Cloth Back and Sides.)	
y	Half Rean 175	44
	(Roan Back ; Cloth Sides.)	
n	Half Morocco 200	6.
1-	(Morocco Back and Corners ; Cloth Sides.)	

The above are all in black, which is the most serviceable color, with the exception of the Half Moocco, which are put up in a number of handsome shades. The name of the paper is stamped in gold on either side, and each Binder is furnished with newspaper files are usually disposed of.

The Binders will each hold the twenty-six num bers in the form of a bound volume. They can be nicely inserted in two or three minutes by any boy of ordinary intelligence; and when the covers are full they can be either preserved in that shape as bound volumes of The Iron Age, or they cal be emptied and used again. There is no possibility are very strong, wear out, when anyone can easily replace them with a piece of fishing line or other mitable string. Subscribers who value the paper should order them at once, so as to keep the paper

On receipt of the price we will ship them, safe put up, by any express line or to any New Yor house to be packed. They are too large to oc

These 3049 were





HERCULES IRON CUTTER.

MILLERS FALLS CO.—Enclosed find draft for amount of inverer, January would have sent the amount before, but did not have an opportunity of tring the Iron Cetter until a few days ago. It is one of the best machines wever saw.

Yours, truly,

MOORE & CO.

Yours, Iruly,

Office of the Athens Foundry and Machine Works, (
Athens, Ga., February 18, 1875.

President,—Dear Sir: Enclosed find draft made payable to
Messrs, Childs, Nickerson & Co., in payment for Iron Cutter
ur Cutter to good service, and find it cuts readily 1½ round, and
iron. C., N. & Co are pleased with theirs, say it will save man;
debuglic business.

Millers Falls Company.

No. 78 Beekman Street, New York,

Barber Self-Fitting Bit Braces, Millers Falls Vises, Improved Angular and Ratchet Drilling Machines, TUBE SCRAPERS, FAMILY TOOL CHESTS, Patent Adjustable Tool Holders, Mitre Boxes, Ratchet Braces, Breast Drills, etc.

The Fisher & Norris Eagle Anvil Works.



These Anvils are manufactured at the oldest Anvil Factory in this country. They are superior to the best English, or other Anvils, on account of the peculiar process of their manufacture (invented and used only by this concern), and from the quality of the materials employed.

The best English Anvils, after a time, become hollowing on the face by continued hammering in use, on account of the fibrous nature of the wrought from—causing it to "settle" under the face.

The body of the Eigle Anvils being of crystallized from, no such settling can ever occur; and the steel face, therefore, remains perfectly true. Also, it has the great advantage, that being of a more solid material, and consequently with less resound, the piece being forged receives the full effect of the hammer, instead of a part of it being wasted by the rebound, as with a wrought iron anvil. An equal amount of work can, therefore, be done on this Anvil with a brammer one-fifth lighter than that required when using a wrought iron anvil which is more elastic.

The working surface is in one-piece of Jasstyp's Best Tool. CAST STEEL, which, after being accurately ground, is hardened and given the proper temper for the heaviest work. The horn is covered with and its extremity made entirely of steel. The body of the Anvil is of the strongest grade of American Iron, to which the cast steel face is warranted to be thoroughly welded and not to come off.

REDUCED PRICE LIST. ANVILS weighing 100 lbs. to 800 lbs., itc. per lb.

REDUCED PRICE LIST. ANVILS weighing 100 lbs. to 800 lbs., 11c. per lb.

Weighing about 10 lb. Price, \$3:50 15 lb. 20 lb. 90 lb. 40 lb. 50 lb. 60 lb. 70 lb. 80 lb. 90 lb. \$4.25 \$5.00 \$5.50 \$6.50 \$7.50 \$9.00 \$9.00 \$10.00 \$10.50

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New York.—Messes. J. CLARK WILSON & CO.—RUSSELL & ERWIN MANUFACTURING COMPANY.—Messes. HORACE DURRIE & CO. Boston.—Messes. GEORGE H. GRAY& DANFORTH. Philadelphia.—Messes. JAMES C. HAND & CO. Balti-more.—Mr. W. H. COLE. FISHER & NORRIS, Trenton, N. J.



Every Railroad Shop, Car Shop, Machine & Bolt Shop, Mower, Reaper & Plow Manufacturer, should have one.

The three sizes if run together would require from 2 to 2½ horse-power.

The variety of shapes that can be made are only limited by the ingentity of the owner. As minutes only are required to make a change from one shape or size to another. All dies are dee of the best Cast Steel, and can be redressed many times.

T. Buton, Countersunk, Rivet and Round Head; Plow and Track Bolts, &c., are made at e revolution. Square and Hexagon Ecads require from 3 to 5 revolutions.

For Simplicity, Durability and Compactness it has no equal.

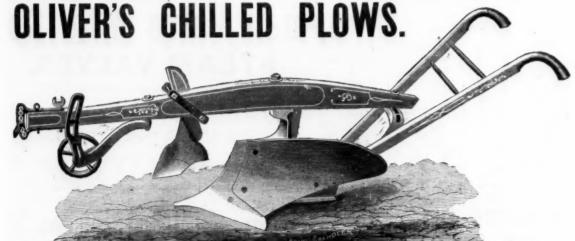
A Boy can learn to run it in a few hours. The bolt is made on the heated bar and cut off in emachine to any length from 1 to 10 inches; if greater lengths are desired, they should be cut fore heating. Either Round or Square Iron may be used.

Will use us as much iron as can be heated in any ordinary blast fire.

For prices and further particulars, address,

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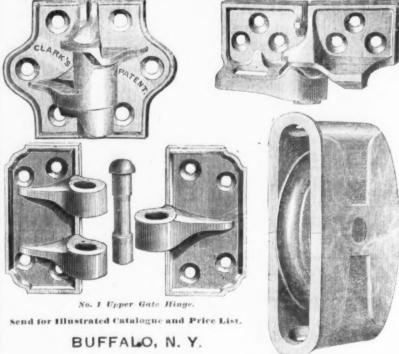


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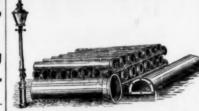
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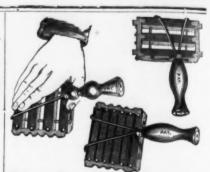


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CLARION

;office and Works, Twenty-Second & Bailroad Streets, Pittsburgh, Pa.

The Lake Superior Copper Interest.

We take the following from a series of papers in Harper's Magazine on "The First Century of

the Republic," by Dr. T. Sterry Hunt: Throughout the crystalline rocks which form the eastern border of the paleozoic basin, ores of this metal are pretty abundantly distributed, and are now mined and treated for the extrac tion of the copper in Vermont, Pennsylvania, North Carolina and Eastern Tennessee, beside which, ores from other localities along this belt, and from various regions to the westward of the great basin, are brought to Baltimore and to the vicinity of Boston for reduction.
The total production from all these sources, which has never been greater than at present, is, however, estimated at less than 2500 tonsan amount inconsiderable when compared with the production of the mines of Lake Superior. In these, unlike the mines just mentioned, and, indeed, unlike most others in the world, the copper, instead of being in the condition of an re-that is to say, mineralized and disguised by combination with sulphur or with oxgyen and other bodies, from which it must be separated by long and costly chemical processes—is found in the state of pure metal, and needs only to be mechanically separated from the accompanying rocky matters previous to melting into ingot copper. The history of the copper region on the south shore of Lake Superior is famous in the annals of American mining. The metal, which in many cases is found in masses of all sizes up to many tons in weight, was known and used by the aboriginal races, and the traces of their rude mining operations are still met with. The first modern attempts at extracting this native copper, in were unsuccessful, and it was not until 1843 that the attention of mining adventurers was again turned toward this region. Numerous mines were opened, and a period of reckless speculation followed, which ended, in 1847, in the failure and abandonment of nearly all the enterprises which had been begun. They were, however, soon resumed under wiser manage-ment, and have been followed up with remarkable success. At first the operations were chiefly directed to the extraction of the great masses of native copper which were found distributed in an irregular manner in veins or fissures in the rocks, and yielded in some cases large profits: but with the exhaustion of these a more abundant and regular source of supply has been found in layers of a soft earthy material, known as ash beds, containing metallic copper finely disseminated, or in beds of a conglomerate of which pure copper forms the cementing material. The successful working of these two kinds of deposits has been arrived at only by well directed skill in management, and by mechanical appliances which diminish the costs of mining, crushing, and washing the rock, and reduce to a minimum the inevitable loss of copper in the waste material. No mining industry illustrates more strikingly than this the importance of such economies. A rock which may be made to yield one part in a hundred of metallic copper, can, under favorable conditions, be treated with profit, and the residue in such a case may still contain one-half as much more copper, which is lost. A mine in this region a few years since yielded annually from the treatment of 1,200,000 tons of rock, 800 tons of metallic copper, being at the rate of wo-thirds of one per cent., and this amount, at the price of copper then prevailing, was just sufficient to pay all the costs of extraction. The residues showed by assay the presence, in a finely divided state, of as much more copper, and it is evident that a greater perfection in the process of extraction, by which one-half of the copper thus lost could have been saved, would have yielded 400 tons additional, which, inasmuch as the costs of mining, crushing, and washing were already paid by the first 800 tons, would have been clear profit. One of the best known mines in the region, which has been worked with continued success since its opening in 1849, produced, in 1872, 1138 tons of fine copper, to obtain which over 100,000 tons of rock were mined, and over 60,000 tons of this selected for stamping and washing, so that the copper yielded was only 1-12 per cent., yet the profits of the year's working were \$200,000. It would be foreign to our plan to describe modes of treatment, but statements of results like this serve to show what may be obtained by the application of skill and science to mining industry. At the Calumet and Hecla mine, the most remarkable one of the Lake Superior region, from 700 to 800 tons of rock are now treated daily, and yield about 4 per cent. of metallic copper, which, when converted into lingots, costs about 13 cents the pound—a price far below that at which it can be extracted from the less rich deposits of the region, or from the ores of the metal by the ordinary process of smelting. This mine produced of ingot copper, in 1872, 9717 tons, and in 1874, 9018 tons, of 2000 ths. The crude copper from these mines, as delivered to the refiners, who melt it into ingots, yields on an average about 30 per cent. of metall—a fact to be borne in mind in consulting the statements of production, which are generally given for the unrefined product. The amou this region a few years since yielded annually from the treatment of 1,200,000 tons of rock, 800 tous of metallic copper, being at the rate of erable quantities of copper to foreign merkets.
The price of this metal is subject to remarkable fluctuations. Thus from 55 cents the pound is 1864 it gradually fell to 19 in 1870, rising again to 45 cents in 1872, and, falling once more to 18 mer of 1874, rose to 24 cents at the close of the year,



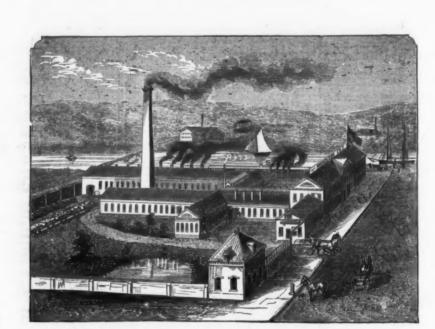
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Finally.-Our Files are warranted to be hard, well cut and sound. They are exclusively used by many of the largest Railroads and Machinists in the country-and the vigorous growth of our reputation, not only for making a good article, but of our ability to furnish a good article cheap, is evidenced by the large number of Dealers and Jobbers who are handling our Files exclusively.

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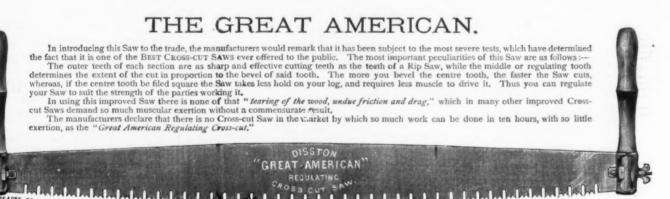
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In filing this Saw, the round edge mill file should be used, and by pressing a little downward as well as sideways you keep the tooth at all times in the same shape it leaves the factory. Attached to the Lumberman and Climax Saws will be found our new patent Cross-cut handle, which is at once the most simple and complete detachable handle now in use. Place the end of the saw blade into the slot in the casting, then drop the pin or rivet into its position, and a few turns of the wing nut secures the handle immovably to the Saw. Although the pin is quite loose when the handle is detached from the Saw, it is by a simple contrivance secured in its place, ready for use,—an advantage which will be fully appreciated by all lumbermen. We guarantee this handle to be superior to any in use,



The construction of the Climax is similar to the Lumberman, the only difference being the introduction of a cleaner tooth between every two sections of the Lumberman tooth, which in some parts of the country is deemed to be an advantage.

It will be observed that the spaces between the points are exactly alike (a principle which we have endeavored to preserve in the manufacture of all our Saws), because it makes the cut clean and even, leaving ample room for dust. This saw can also be easily kept in perfect order, and the tooth will retain its original shape by the proper use of the file, as directed in the article on the Lumberman. A Gauge for reducing the length of cleaner teeth will accompany each Sew.

CLIMAX

THE PARTY OF THE P

THE NONPAREIL.

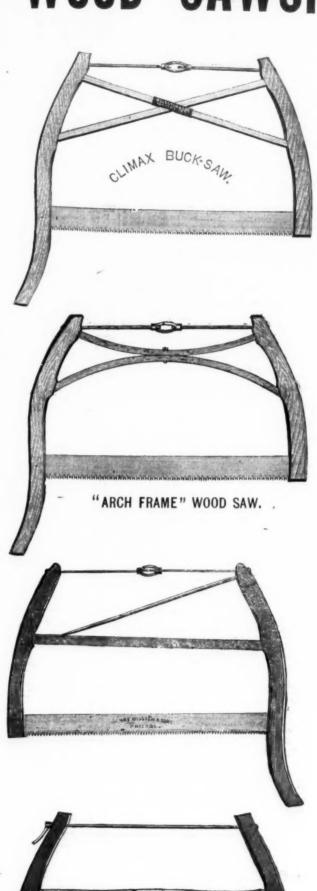
The Nonpareil, of which the accompanying cut is a representation, is composed of sections of four cutting teeth, each section intersected by a cleaner tooth. It will be observed that the cavities on each side of the cleaner teeth are much larger and deeper than those of the cutting teeth, serving as a receptacle or chamber for dust, and effectually freeing the Saw during the operation of cutting. The cleaner teeth should always be kept shorter or lower than the cutting tooth. (The Gauge, as shown below, is made expressly for this purpose, and by its use the cleaner teeth of any Saw can be regulated and kept of exact length.)

This Saw has given unbounded satisfaction wherever it has been used, and we are constantly receiving orders for the same; in fact, in some receiving and for a continuous continuous

some sections, and for sawing soft lumber, it is preferred to any other Saw.

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He el ls. dis 70&5 G 70&10 g Hanta, Light Brass. dis 70&5 G 70&10 g Extra Heavy dis 40&10 g White Metal. dis 50&10 g Biver Chime dis 15&10 g Gli 10 g He had a dis 50&10 g	Japanned Gaivanized Morning Glory Funne
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Cow -Common Wrought	Bemis & Call Co.'s
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July 8, 1875.	.1.	HE IRON AGE	•	31
Stocks and Dies	Candlesticks, Japanned	U'NEILL'S PATENT PLANISHED COPPER.	Glass. French Window—1st, 2d, 3d, and 4th qualities. Per box of 50 feet.	A. C. Downing & Comn'v
Slips # 10c	Chamber Pails, Japanned	12 os. and lighter	SINGLE THICK.	Wm. C. Stuart. Francis Dougherty.
Washits Stones	Nos. 2 4 5 6	7 in., 14x52, 8 in., 14x56, 9 in., 14x60 14 and 16 oz. and heavier	6 x 8 to 10 x 15. \$7.50 \$6.75 \$6.50 \$7.50 \$1 x 14 to 16 x 24. 850 7.75 725 850 18 x 22 to 20 x 30. 10.75 \$9.75 9.75	Importers of and Dealersi n
Grindstones, Family, J. F. Green & Brodis 30 % sageve Polish.	Dass Tails, Cornegated: Pint 5 Per gross, \$200	14 and 16 oz. and heavier	18 x 22 to 20 x 29 . 10-75 9-75 9-75 15 x 36 to 24 x 39 . 12-25 10-75 9-90 12-26 x 28 to 24 x 39 . 13-90 11-50 9-75 9-75 26 x 28 to 24 x 39 . 13-90 11-50 9-75 9-75 26 x 38 to 26 x 34 to 30 x 59 to 14 to 30 x 59	Window Class
			26 x 46 to 30 x 50	Window Glass,
Squares dis 50 %; full cases, dis 50&10 %	Toy Cups, Straight. No. 1 2 8 75 2708 Toy Cups, Straight. No. 1 2 8 75 2708 Toy Cups, Fiaring. No. 1 84 25: 2 48 75 9 2708	LEAD-DUTY: Fig \$1 per 100 lbs.; old Lead, 1% cent per 1b.; Fipe and Sneet, 2% cents per 1b.	30 x 56 to 30 x 54 16 00 14 0 12 0 30 x 56 to 54 x 56 17 25 15 5 19 5 19 5 19 5 19 5 19 5 19 5 1	FRENCH PICTURE
Stir Try Squares and Bevels	Toy Banks, Gothic. No. 1, \$600, No. 2, 400 per gross Toy Cups. Straight. No. 1 2 5 Toy Cups. Fiaring. No. 1, \$100 per gross \$75 25 27 5 75 25 27 5 75 25 27 5 75 2 5 75 2 75 2 75 75 2 75 75 2 75 75 75 75 75 75 75 75 75 75 75 75 75	Spanish	DOUBLE THICK.	And Car Glass, etc.
Tacks.	PLANIGUED TIN WATER ALE DO C	Pipe	6 x 8 to 10 x 15 \$12.00 \$11.00 \$10.00 \$9.05	Estimates given by mail. 57 Beekman & 87 Ann Sts.
Full Weight American Iron	Each	Sheet.	15 X 86 to 24 X 80. 19 75 175 1450 26 X 28 to 24 X 86. 21 19 1450 15 75 26 X 86 to 26 X 44. 25 25 12 25 12 15 15	NEW YORK.
Trunk and Clout	Each '70 '80 '95 105 125 Pints 2 3 4 5 6 Planished Tea Pots, Oyul.	N. P. U	30 x 52 to 30 x 54. 28-75 23-25 19-25	MINERS' CANDLES.
From Shoe Nails, # 25 4-8 and longer, 9%c; 3%-8, dis 7% 4 10c dis 7% 4 10c dis 5% & 10 4 10 10 10 10 10 10	Plants de Pepper Boxes, No. 1	at 7 cents perib., our under, 2% cents; over 7 cents, and not above 11, 3 cents per 1b. over 11, 3% cents per 1b, and 09 ad val. Rallway Bars 1% cents per 1b. Rall- way Bars, in part Steel, cent per 1b. Provided, that Metal cemented, cast or made from Iron by the Bess-	36 x 60 to 40 x 60	Superior to any other Light for Mining
Tapes, Measuring	Planished Round Coffee Biggins. 1/10153 3 4 5 6 Each\$1.00 1.10 1.20 1.40 1.60 2.00 Planished Oval Coffee Biggins.	way Bars, in part Steel, I cent per lb. Provided, that Metal cemented, cast or made from Iron by the Besse- mer or pneumatic process, of whatever form or de scription, shall be classed as	Sizes above—\$1200 per hox extra for every binches. An additional to per cent, will be chatged for all Glass more than \$4 inches wide. All sizes above \$2 inches in leagth, and not making more than at united inches will be charged in the \$4 united inches brack at	Purposes. Manufactured by
Ten Trisya. American Tes Tray Co	Each \$1.15 1.25 1.40 1.60 1.60 2.25 Planished Oval Chating Dishes, Imperial Covers.	Fool American Cast Steel	be charged in the 84 united inches brack et Discount 50 @ 50&5 %	JAMES BOYD'S SONS,
Toe Calks.	Inch	Spring 10c	PRATT	of CO
Wood Bottom per doz \$12-ais 25&10 % All Iron per doz \$19 50-ais 25&10 % Tinners' Tools and Machines.	Inch	File	Hardware & Iron Mer	chants Buffalo N V
Traps. Newhouse dis 20 %	Planished Imperial Dish Covers, Inch	Tool Chrome Steel.	Manufacturers of the	Superior Brand,
Blake's Patent Mouse, Wood Choker	Pints	1001	BUFFALO FORGE	D HORSE NAILS.
" Round, Wire # doz \$1 \$0 to 2 00 net " Square, " # doz 2 00 to 2 53 net Cage, " # doz 2 50, dis 10 %	Pianished Oval Melon Molds. Per doz \$2-00 2-10 2-45 Pianished Oval Melon Molds.	Hammer, 15c, Gun or Homogeneous, 15c, Gun or Homogeneous, 16c Engiten Steel, payable in gold, net. # n 17%c	These Nails are superior, being made with new and implest brands of Norway Iron.	roved machinery and actually hammered from the very
Lothrop's Brick and Plastering. dis 10 g Disston's Plastering. dis 12% g Oisston's Plastering. dis 12% g	Each	Extra Cast Round Machinery, Cast Swaged, Cast Best Double Shear Blater Jet anglire		
Brades' Brick	Po nt 1, 2, 5, and 4 O, 45, Urnseach, \$2.50 Planisaced Oval O, G. Urns	Best Double Shear 1735 1446 1536 1646 1656 1656 1656 1656 1656 1656 165		
Rutter and Cheese dis 25 %	Plantahed Robard Overtor Dishes (Corpulate) Nos. 1 9	3d quality 10%c		
Nickel and Gilt	Each 32 10 2 50	Sheet Cast Steel, 1st quality		
40 to 160 lbs. 16c 160 and over . 18s Peter Wright's \$\mathbb{B}\$ \$\mathbb{B}\$ \$\mathbb{15} \cdot \c	Each \$0':00 0'36 The Pot Handles—P. S. & W	Mill. 134c Taper to 4 inch. 16c Taper 3 and 3% inch. 18c		
160 and unward	Stow s Fatent Hollow Ten Fot Handles. No. 1, Small 45 inches	Car was a service and a service and a service, dr 20		
Wilson's Paraliel	Solid from Tin Tipped	per 100 lbs	A A	
Marrill's Parallel	No. 10, Small, 4% inchesper gross, \$9.00 No. 15, Medium, 5½ " 950 No. 20, Large. 6½ " "0.75 Stow's Patent Holdw Tea Pot Handles, Adamantine	Banca W 3 23% @ 24c., gold	, V	
Parker's dis 15 de 35	Bronze—P. S. & W. No. 12, Bronzed and Tin-Tipped	Straits.	7	V
Canai (Pugsley & Chapman) new list dis 12½ % Coal, Garden and Stone (Pugsley & Chapman) dis 25 % Well Wheels. Revised list dis 60&10 %	No. 1, 534 aches long	12x12, 10-75 14x20, 11-00 1 x 10x14, 12-50	Orders solicited from the Trade.	9
	No. 3, 61/4 4 4/00 No. 4, 71/4 4 4 4/25 No. 5, 8 4 4/50 No. 6, 9 4/75	12x12,	GEORGE B. WALDRIDGE	10
Wife. dis 10 % Brass and Copper. dis 10 % Bright and Annealed. Nos. 0 @ 18 dis 40 45 % "19 @ 26 dis 47 % 65 25 % "37 @ 26 dis 22 % 6 5 5 % Coppered. 0 @ 18 dis 20 6 6 5 % Galvanized. Nos. 0 to 9	No. 1, 5) inches long	For each additional X add. 2°25 CORE TIN PLATE. Bust. 2d Quality. Ordinary. I C 10x14. \$950 @ 10*00 8*25 @ 900 8*25 I C 12x12. 10*10* 0*10*3 900 @ 925		
Tinned dia 16 G 90 d	No. 4, 714 ** 5-25 No. 5, 8 ** 5-50 No. 6, 9 ** 5-75	I C 14x2010·00 @ 10·75 9·00 @ 9·50 8·25 @ 8·75 TERNE PLATE.	Francis Axe Co.	"George Washington"
Cast Steel. dis 15 @ 20 % Tinned Broom Wire. dis 19 @ 20 % Tinned Broom Wire. dis 20 @ 31 % Calvanized Telegraph, Nos. 8 and 9 % % 19 % 6 @ 9 % 6 **Alvanized Telegraph, Nos. 10 and 11 ** 15 10 % 6 10 % **Alvanized Telegraph, Nos. 10 and 11 ** 15 10 % 6 10 % **Alvanized Telegraph, Nos. 10 and 10 ** 1	Japanned	I C 14x20 \$ 9·25 @ 9·50 8·50 @ 9·00 8·00 @ 8·75 I X 14x20 11·75 12·00 @ 18·00 16·50	Buffalo, N. Y.	HATCHETS,
Fence Staples	Nos	1 X 5528 24.00 @ 24.5) 1 C 20x200 23.25 @ 23.50 ZINC.—DUTY: Pig or Block, \$1.50 per 100 lbs. Sheet	Diamond Edge Silver Steel	Berch Axes, &c.
Judd's Picture Wire	Per gross pairs75c 88c \$125 1:50 1:75 2:25 2:75 4:00	2½c. № b. Sheet	AXES.	Orders Solicited.
Baxter's Adjustable "S"	Per gross pairs	Old Metals.	G. B. WALBR	IDGE & CO
Coes' Genuine dis 4045-5	Nos. 1-00 1-25 1-30 1-35 2-50	(Dealers' Selling Price.) Copper	99 Chambers Stre	
Tat's Pattern. dis 70&10 % Davis "atent Duplex. new list dis 25 % Bemis & Call's Patent Combination. dis 20&6 5 "Merrick's Pattern. dis 22&24 %	No. 30 Large	Heavy Composition		
** Brigg's Patent	In cases of 100 lbs. each. Milk Can or Boiler Hundles—(P. S. & W.) 4\/4 indis 25 \/\ext{flain}, 8c.; Japn'd, 9c.; Tinned, 15c. per lb.; Maile- able Cilps or Ears to match, Tinned 20c per lb. Toilet Ware Hanales—4\/4 inches (P. S. & W.)	Cast fron		
Novelty	Toilet Ware Hanales—454 inches (P. S. & W.) dis 35 5 Plain with drilled holes, per ib 9c Plain with Cast 8c Plumbers' Scrapers—(P. S. & W) dis 25 5 Extra quality, length 6 in. per doz	Zinc. 6 5% Pewter, No. 1 17 18 No. 2 10 6 12 Spelter 5 6	Project.	
Eureka (Friction)	•	Paints, Oils, etc.		
TIN WARE AND TRIMMINGS.	METALS. 1RONDUTY Bars, 1 to 14 cents per lb., Sheet, Band,	Clack, lamp—Coach Painters.		
COMMON STAMPED WARE, &C. Bucket Covers.	Hoop and Scroll, 14 to 13 cents per 10. Succession, Hoop and Scroll, 14 to 13 cents per 10. Provided, that none of the above Iron shall may a less rate of duty than 35 per cent. Pig. 37 per ton; Polished Success cents per 1b; Wrought Scrap, 38 per ton; Cast Scrap, 46 per ton. Ealfroad, 70 cents per 100 lbs. Boiler and Plate. 14 cents per 1b.	" lvory Drop, fair. 15c		
Per gross\$2-00 2-60 3-40 4-25 5-75 Quarts 6 8 10 12	\$6 per ton. Railroad, 70 cents per 100 lbs. Boller and Plate. 1% cents per lb. Pig 1ron—American.	Bine, Frassian, Tair to best		
Cake Box Covers. Small. Medium. Large.	Foundry No. 1	Brown, Spanish 1% C	Shears for Rd. & Square ¼ to 1¼ in.	
Inch	Cotness	Green, Chrome	Successors to the	
lach 10% 11% 11% 12% 12% 13% 18 12 12% 13% 19 10 10 13 10 18 75 16 50 10 10 10 18 75 16 50	Gartsherrie "31 50 @ 33 00 Eganton "30 00 @ 31 00 Har Iron. Am. Renned, at mill. 2 6c. @ 2 90	Orange Mineral14c	BIDDLE M. & T. CO.,	
Per gross	Weish, gold	# English 105c Wenetian (N. C.) dry 22 c in oil sest'd cans, lic; kegs, 85c Indian, dry 10c Rose Pink 12c	Lyon's Patent H:	in. 14 in. plates. Shears for Plates and Bars.
Jelly Cake Pans. 10	Wrought Scrap. " \$0 00 @ \$1 00	Sienna American, Raw	DRILLS, SHEARS AND	
Plain	Common Iron. 1 to 2 in. round and square} \$\pi\$ to 2 in. round and square} \$\pi\$ ton \$57 50 \$\pi\$ 60 00 Refined Iron.	Umber, Burnt 4 6 8c 1 66 21c 1 8	For workers in Iron and Ste	el, adapted for all trades.
Rimmaed 2% 3 3% 4 4% inches. Per gross \$2 25 250 8:00 3:50 4:00	% to 2 in round and square } " 62 50 @ 65 00 1 to 6 in. x % to 1 in	Vermillion, Chinese	Send for Circulars.	AGENTS WANTED.
Per gro. \$6.00 6.35 6.35 7.35 7.35 9.50 10.00 12.00 19.00	Hoope—% to 2 in " 87 50 @ 140 00	" Trieste	\mathbf{Buff}	fallo
Sheet #50 600 11:50 Scolloped Cake Pans. Small. Large.	Swedish Iron. " 182 50 @ 185 00 Plow size. " 145 00 @ 150 00 Sheet Iron.	in ofiasst'd cans, 11c; kegs, 8%c		
Without Tubes	American and English. American. English. Nos. 10 to 20	Chrome	Stove Roards	or Diatforms
Common Square Pans (One Sheet).	11 to 24	Ulla.	Stove Boards (oi rialiviilis.
Per gross	28. 25 to 30 prime, \$\psi \(\frac{5}{2} \) 28 quantity \$\psi \(\frac{5}{2} \) 28 quantity \$\psi \(\frac{5}{2} \) 38 qc \$\psi \(\frac{7}{2} \) 39 qc \$\psi \(\frac{7}{2} \) 49 qc \$\ps	Linseed Raw	TWENTY-FO	UR SIZES.
Add \$1 per gross, or 10c. per doz. to fist of Pot Covers.	Patent Polished	Sperm, Crude.	Rog	
Plain. per gro. \$4 00 4 30 5 00 5 50 6 00 7 00 Jap'd or Burn'd. 600 6 50 7 00 8 00 9 50 10 00 Coffee Botler Lips.			24 ix 26	24 " 26.29 " 2
To Rivet per gross, \$0.80 1.10	5 5½ 6 7 inch. \$2.59 2.50 4.50 5.25 6.50 per doz. RUSSIA IBON. 4½ 5 5½ 6 7 inch.	Spaing 124 Spaing 125 Spaing 125 Cotton Seed, Crude 60e Southern Yellow 65e White 70c @ \$1*16 Natural Lubricating 38c @ 40e	30	28 * 30x36 * 30x42 * 32x40 * 32x42 * 32x40 * 3
STAMPED DEEP AND RETINNNED WARE, dis 30 5. Plain Stamped Water Dippors, Spint. Pint. Quart. quarts. 2½ quarts. Per doz 30 1:15 1:50 1:65 2:50	4½ 5 5 5½ 6 7 Inch. \$500 700 9930 12:00 14:00 per dox. COPPER -DOINT. Pig. Bar and Ingot, 5c.; old copper, 4 cents \$\phi\$ \$\phi\$; Maturactured (including all articles of which copper is a component of chief value) 45 \$\pi\$ at	Asphaltum	55 40	34 · 32 · 44 · 36 · 34x 45 · 4
Retinned Milk Pans. 15	waiorem. American Ingot № D 23¼ @ 28¼c	Chalk 15¢ "Block Dryer, Patent, Am'n ass't caus, 105c.; kee's St "English it: 9		ne superiority of material and construction of these e Boards are now acknowled ed by alt.
Upper Howis, Plain Stamped—Quarts 1 2 25 Per doz 10 125 1-75	English BHEATHING. BRAZIERS COPPER, BOLTS, &G, Braziers Copper, ordinary rizes, over 16 oz., per anuare foot. 31c. P.	Frostings. 50k		Manufactured by
Per doz. 75 % 1'06 Per doz. 1'40 1'75 2'25	square foot	" Sheet. AC Glazites" Points, Zinc 9c Gum, Copal 8c Sec Dama & Sec Dama & Sec	S	dney Shepard & Co.,
Surface 15 of 14 17 21 30 for dot	Circles less than 94 inch in diameter	Damir See Damir See Damir See Shelisc English See Cark See Litnarge Stone, selected Lumps 6666		BUFFALO, N. Y.
Canisters, Common Pound 4 1 3 3 Canisters, Hunsed Pound 1 14 2 3 4 Canisters, Hunsed Pound 1 14 2 3 4 4 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	Lacomotive Fire Box Sheets. Sitc. Sheathing Copper, over 13 oz. per sq. ft. Sitc. Sheathing Copper, over 13 oz. per sq. ft. said ughter. Scc. 13 oz. per sq. ft. and ughter. Scc. 13 oz. per sq. ft. and ughter. Scc. 20 oz. per Bottoms. Scc. 9 St. Per sq. ft. said ughter. Scc. per scc	Putty in bladders	GEO. B. WALBRIDGE & CO., Agents,	se send for Illustrated Circulars,
Canisters, HinsedPound 1 145 2 3 4 4 (Canisters, SquarePound 2 4 8 8 12 16 (Canisters, Square	No Copper is Sheathing except 14x48 nches, and not to exceed 34 oz. to the square foot.	Spirits Turpentine 840 Whiting, Spanish 10	GEO. B. WALBRIDGE & CO., Agents,	99 Chambers Street, New York.

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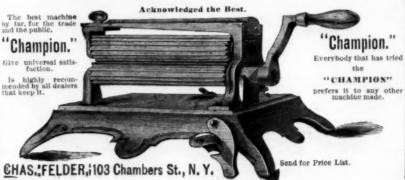
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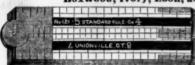
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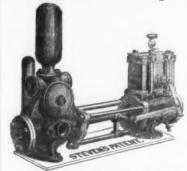
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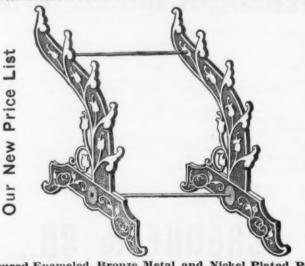
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Common Spring with Hook \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
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Common (Tissue Paper Weight)dis 70&10 %
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plete with augers
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Western Philadelphia " " special prices
Philadelphia "dia 60 4 dia 60 4 dia 60 4
Eagle, (Coleman's)dis 60 %
Wrought Shutter, Stanleydis 50 @ 50 x 10 4
Braces.—Barbersuis 40&5 9
Packusdis50 9
Bartholomews American Ball dis 10&10 @ 15&10
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Broaddis 35&10 @ 40&10 g Cast Fast Loose Joint
Cast Fast Loose Jointdis 45&10 @ 50&10
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" Mayers & Parliamentdis 35&10 @ 40&10
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Parker's Blind Butts
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Sooket Firmerdis 60 @ 60&10 %	18
	B
Beatv s Framing and Firmer	1 "
Porcelain Wheel Beddis 30&10 @ 40 %	1
Iron and Brass Wheel Plate dis 40 @ 40&10 %	1
Parcelain Wheel " dia 50 @ 504-10 d	1
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Wanter to R4 (W)	1 -
Discount on 2 dozen lots. \$3 per dozen.	
Coffee Mills.—Common Box and Sidedis 15 %	1
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Boits—Carriage and Tire	
Braces—Bit, Spofford's Patent	1

	June 1, 1875.		
1	Augers—Snell Mfg. Co		
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ı	Wrought Butts, Loose Pin. Belting-Rubber. Leather, new list, oak tanned	dia s	US a
ı	being hubber to the second sec	0 00 1	10 6
L	Detail Bathew list, oak tanned	cate ;	201
П	orick-bath (box of 2 doz) Best English	die .	2017
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1	Can Openers—sprague's. Cases—Parlor Coal Hod. Chalk—White, Carpenter's. Red, Carpenter's. # ###	dia:	30 1
ı	Chair-white, Carpenter s	uls	TO I
1	Red, Carpenter's Sucket.	COBB.	240
1	Blue, "		SPUN
ı	Chisels—Firmer Socket	100	10
ı	Framing Socket	1000	10 9
ı	Corner Socket Chiseis. dis 60, Slick's Carpenters' dis 60	100	10
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ŧ	Casting Malleable	10%	10
ŧ	Egg Beaters-" Peerless"	St D	10
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ł	Elbows-Corrugated 5 812 per c	loz	2.0
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Spoons, Iron Tinned	T
Plated Rogers' A No. 1	NT
Britanniadis 50 &	^
Squares—Steel and Iron	V
Fairbanks	
Stove Polish-Gem R gross, \$4.50	
DIXON'S 6:00	
Tracks Male Works Ave Iron	
Faironnes	
Vices Durallel Buffalo	7
Ware—French, Tinned and Irondis 30 %	-
Stamped and Japanneddis 25 %	
Cast from Hollow.	
Cast fron Hollowdis 58% 5 Tin Plates.—Add for each Xdis 58% 5	
10x14, I(), Charcost \$11'00 , 14x204; terms \$10.00	
10x14. IU. Charcosi\$11.00, 14x30 U. terme	
125cx17. ** 11°00 : 20x28 X. ** 98:00	
Pis Tin-Straits	
Har Tin	
Melder-No. 1. Crook's	
Refined, No. 1, 10%c; No. 2	
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** Lasale '	
810 75 11:05 W 100 ma	
Tron Wilms Bright and Annealed	
Tinned Broom, Nos. 20 21 22 dis 25 5 Tinned Broom, Nos. 20 21 22 dis 30 5	1
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Tinned Broom, 20c 21c 21cdis 30 %	
Planished W B 87c @ 9uc	4
Bottoms B SSc	
Bolts 1 1 31 @ 83c	
Braziera' Sheets 31 @ 33c	
Sheet Iron.— 18 Common84 30	1
18 Common\$4 30	ľ
24 Common	
Am. Russia A. B.	
140 110	١,
Gen. Russia, No. 1 stained	

lvaniseddis 25 %
CINCINNATI
orted by Sellero & Co., Importers and Jobbers Metals, No. 214, 216 and 218 Main street.
Plate.—I. C. 10x14 Charcoal. \$12 00 @ 15 00 X. 10x14 Charcoal. 14 50 @ 15 00 C. Terne 14x20. 10 50 @ 15 50

1	Metals, No. 214, 216 and 218 Main street.	
	Tin Plate,—I. C. 10x14 Charconl	18°00 15°00 13°50 28°00 23°00
	Pig	D 31c
	Solder	10 17c 10 13c 134c.
	Copper-	# 24c
	Plantshed	@ 590 @ 530 @ 530
		@ 350 @ 350
2	Zinc. Cask, 500 to 1000 lbs % b	6 88c
0	Slab,	714c
t	Wire, No. 0 to 20	85c 40c
t	Allows?	36c 30c
0	Antimony	% 17c
-	Sheet Iron.—Gen. Bussia.	b 14c
	Com. B. Fin. S. L. U. D	mooth Re'fd. 78-10 74-10
ē	22 to 24	75-10

NOS.	antzed la 15 to 20	130	1 No. 2			140
Den	22 to 24 steel.—Sil	130	160 · C	Manager 21c		100
Iron	Wire	ver, w in	100; 01	escent, are	dis 3	3 9
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One	Piece Cor	rrugate	d Elb	OWA.	db	10 %
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Dog	Irons	*********	******	*******		.4

Dog trous c
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The following are the Card rates of Lewis, Oliver & Phillips, H. B. Newhall, I Warren St., New York, Agent. Iron, standard list assorted sizes, for large orders, c. card rate, 2 % off net. All prices f.o.b, currency in Pittsburgh.
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large sizes, from 7-16 to 2 in
amall sizes, from 3-16 to 1/2 in
large sizes. from 7-16 to 1% in
Harrow Teeth. in lots of 1 ton or more, packed in caske 1 in. diam. Sic ? B net; %. % in. diam. Sic ? D net % in. diam. 4c ? B net.
Patent Headed Harrow Teeth, packed in casks. ሂር ም ከ c Skein Bol's, in bulk, in lots of 1 keg or n.ore, % in, dian 5 ሄር ያ ከ net; \$-16 in, diam. 6 ሂር የ ከ net; ½ in, dian 7 ሂር ኞ ከ net. 1c ኞ ከ extra when less than 1 keg o each size is ordered.
Screw Hook and Eye Hinges. If to 1 in. diam. 9c P net; In. diam. 10c P B net; In. diam. 12c P B ne Screw and Strap Hinges. In lots of 100 pairs or more. 14 of in. long. 5%c P B net; S. 10c P l. in. long. 6%c P B ne Strap and T Hinges33%&10 g off net, delivery as cu
tomary. Screw Hitching Rings
Bridge and Roof Bolts— 1 to 2 in. diam. over 8 ft. long

Screw	Hitchin	ng Rings				.85	25 %	R 10	0 net
Duck 3	Vest Tu	ivere Iro	ns			14 !	50 38	do	z ne
Case Ir	on Wa	shers					33	Ph 4	c ne
Bridge	and It	nof Hate	O						
1 to 2	in, die	m, over	8 ft. 10	ng		3	0 %	4	c ne
1 to 2	in, dia	m. from	4 to 8	ft. lon	gr		66	430	e ne
1 to 2	10. 018	m. from	136 10	4 77. 1	ong		0.0	434	CDA
46. 30	and 36	in. diam	. over	4 ft.1	ong		14	48	e ne
46. 36	and 36	in, diam	. from	136 to	4 ft. lo	mer		612	c net
Bridge	bolts	w.th ups	et ende			. 360	1. 30	Th	OXEN
Wroug	ht from	plates,	punche	d			No.	30 1	a ne
		WA	OON H.	ARDW	ARE.		(PQ)		20
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Wago	n Box I	Rods, nar	row t	rack,	each				18c
Single	Tree I	rons. #	set of	four r	feces.				SRC
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	46		60	3	44		14		65c
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Wagon Br	ake Ratche	ets, each.			16
	,	nnish	ed with	guard, e	ach45
Wrought l	Hammer St	traps, hea	vy patte	rn, each.	16
44	66	" ligh	12 40	each	18
66 F	tub Irons.				11
Stay Chair	Hooks, e	ach			R
Double an	d Single Ti	ree Clins.	flature 1.	each	9
66	66	66	1 2	each	10
45	44	61	44 8.	each	12
Strap Bol	ts, Rods,	dingle Tr	ee Iron	s. Bolst	er Plat
Brake R	atchets, Ha	mmer Str	aps. Rut	Irons. S	tay Ch
Hooks a	nd Clips, in	lots of 5	O sets	and and it	dia 2
Wagon Bo	x Staples, 1	142021/1	to elin	ph 39 100V	411 On
Hallon Do	(f Plane)	Dow Ynon	to continu	CH. W. LOU	WILL GO
NY N/	Deve	Box Iron	, to rive	con, w to	00 7 50 1

**	WILD %	rings.	each		734C I
King Bolts, 34, 1, 1	36, and	136 in. 4	diam		D 4360 1
Wagon Rivers, ex.	large, t	at, ovi	it and st	eeple	
head, 14 in. diam	, all len	gths		6	61 30 C. I
Wagon Rivets, 3-1	6 in, dia	m., a'!	lengths	6	
. 66 N	ulls, in 5	m pape			
			od "		56c ex
Wagon and Hinge	Nails,	6 in		······	10 17 CI
	** ;	3-16 in.		4	1a C i
Double Tree Plate					85601
Coupling					5%c
Tongue "					
Neck Yoke Plates Tongue Cap Iron,	*****	A	***** **		11 0
Band Iron,	1%, 2 &	2% in.	wide, s	ame pri	ice # B

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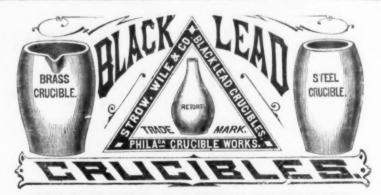
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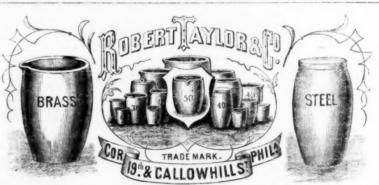
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ı	BOSTON.	Wardrot
l	(Reported by Macomber, Bigelow & Doicse, 156 to 164	Weather
	Augers Watrous Ship. dis 10 % L Hommedien Ship. dis 15 % Axes Forester's Favorite, Bronzed. \$12.00 Blue - Jackets. Sinc. 11 5 Excelsior, Black. 11 00 Chopper's Fride, Bronzed. 10 90 Red Cross, Red. 10 90 Red Cross, Handled. 10 90	Weights. Wedges- Wire Eureka, ! Wire Ne Drab or) Wrenene Walton Wringer (Novel
	A (Extra, \$250. B (No. 1) \$100. C (No. 2) \$150 \$\psi\$ dos Bells, Steigh — Fancy Body, Patent Leather, Cloth Bound, White Mctal, 30, No. 1. Fancy Body, Patent Leather, Cloth Bound, White Metal, 36, No. 1. Fancy Body, Patent Leather, Leather Bound, Extra Timed, 36, No. 1. Fancy Body, Patent Leather, Leather Bound, Extra Tinned, 36, No. 1. Fancy Body, Patent Leather, Leather Bound, Siver Plated, 30, No. 1. Fancy Body, Patent Leather, Leather Bound, Siver Plated, 30, No. 1. Shaft, Strap, White Metal, House Bells, extra, 6, No. 1. Shaft, Strap, White Metal, House Bells, extra, 6, No. 1. Shaft, Strap, White Metal, House Bells, extra, 6, No. 1.	Eureka Withingto Hoes, Ra
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ı	Brass Butts. Acorn Loose Jointdis 40&10 %	Tin Piat
	Brass Butts. uns 30 g Wrought Table Butts and Back Flans uns 30 g Wrought Narrow Butts. (4s 30 g Fan Openers—Sprague's dis 50 g No. 1. Iron Handle 4500 No. 2. Wood Handle 4500 Cartriages.—" U. 8. Cartriage Co." dis 50 g 20 g 15 g Socket. Lightning 450 d 23 g 25 g Socket.	I. C. Co. Char. Ro Coke Pig Tin. Banca Straits. English.
	Redheffer patent. 3 4 5 6 gall Ceal Hods. dis 55 7 and 7 bin., \$100 (5, 16 in., \$100) Fancy Japanned, No. 4, 15 in., \$100 (5, 16 in., \$100) Pancy Galvantzed, No. 4, 15 in., \$1150 (5, 16 in., \$130)	Apple P. Hudson' AxesV
	6, 17 in., \$14'00. Perfection, Jap'd, No. 4, 15 in., \$12'00; 5, 1; in., \$13'00; 6, 17 in., \$14'00. Perfection, Galv'd, No. 4, 15 in., \$15'00; 5, 16 in., \$16'00; 6, 17 in., \$17'00. Morning Glory, Jap'd, No. 4, 15 in., \$12'00; 5, 16 in., \$13'00; 6, 17 in., \$14'00.	44
	A. T. Lin., 1079, Jap'd, No. 4, 15 in., \$12.90; 5, 16 in., \$1290; 6, 17 in., \$14.00; Morning Glory, Galv'd, No. 4, 15 in., \$15.00; No. 5, 16 in., \$16.00; No. 6, 17 in., \$17.00. Compasses and Dividers.—Bemis'	Hunt's, Axtes.— cating

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Boston Belting Co.'s Rubber Medium Sizes, dis 30&10 & Small Sizes, Hydragt. Simall Sizes, Hy dis 40 < 1 ce Topis.—W.T. Wood & Co. Baw. ... new list net W.T. Wood & Co. Baw. ... new list net W.T. Wood & Co. Scheet Histochest. ... new list net Axes. new list net I conding Touge. ... new list net I conding Touge. ... new list net I medium. Small and Family Touge. ... new list net Grappies. ... new list net Chiseis, Hooks and Grappies. ... new list net Republication of the Chiseis and Grappies. ... new list net Chiseis, Hooks and Ch | Single, | 75c. | 85c. | 1100 | 113 | 125 | 1:60 | 118 | 1:60 | 1:18 | 1:75 | 1:60 | 1:18 | 1:35 | 1:60 | 1:18 | 1:35 | 1:60 | 1:18 | 1:35 | 1:60 | 1:18 | 1:35 | 1:60 | 1:18 | 1:35 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | 1:75 | Axe. — Axe. — b 102 85 cm. — 10

St. Louis Metal Market. (Corrected Weekly by Mesars, R. Sellew & (o.)

CHICAGO.

1	(Reported by Frank Sturges & Co., 73, 74 & 76 Lake St.
ı	
1	10x14, IC, Ch'l. Good. 14x20, IXX, " " . 17
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ı	Block Tin.
П	Large Piga
1	Small 27c Straits, 2c, higher,
ı	Zinc.—Sheet, 500 to 1000 lb. Casks
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1	Ingot
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	30x60, 6 to 8 lbs. * B 25c 30x60, 15 to 100 lbs. * 3 3
1	30x60, 10 & 12 lbs " 83c
	Solder - F. S. & Co 's make
	Best Fine
	No. 1
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į	Braziera' or Spetter Solder
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	No. 2
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8	Smooth, Smooth Smooth
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ž	21 to 24 13c 28
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i	Perfect
	American Russia. B



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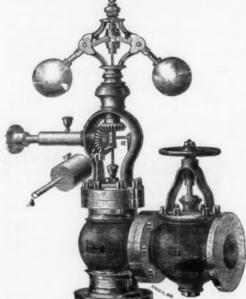
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Capacity of Valve or Diameter of Steam Pipe in inches.	Price, Black.	Price, Bright Finish.	Price, Portable.	Price of Lever Attach- ment for altering speed.	Price of Stop Valve.
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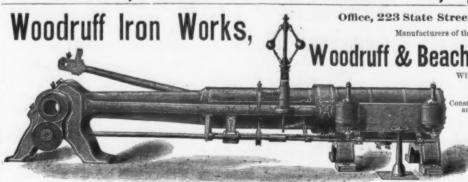
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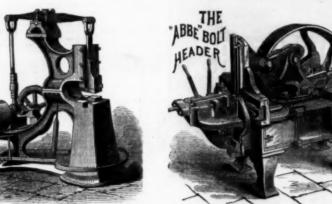
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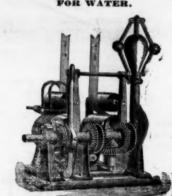
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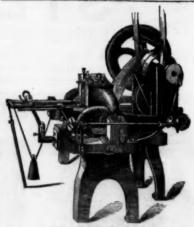
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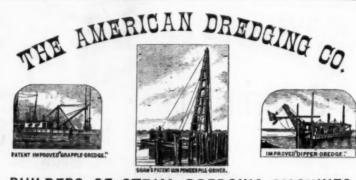
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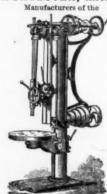
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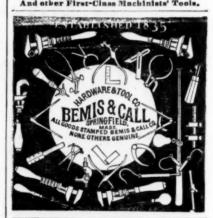
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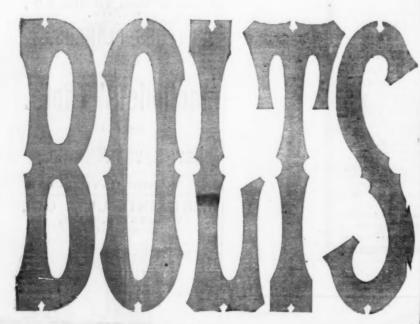
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